**IMPORTANT**

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

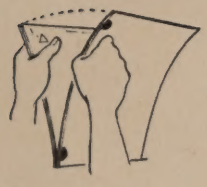
# This PHOTOFACT Folder Set is

## WIRE-SEALED FOR YOUR PROTECTION

## to guarantee completeness of contents

**DO NOT ACCEPT IF SEAL HAS BEEN BROKEN**

**TO OPEN** ***JUST DO THIS:***



**1**

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

**2**

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.

**3**

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

**4**

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

*Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .*

**IMPORTANT**

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

# The PHOTOFACT® Servicer

SET 476 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ MARCH 1960

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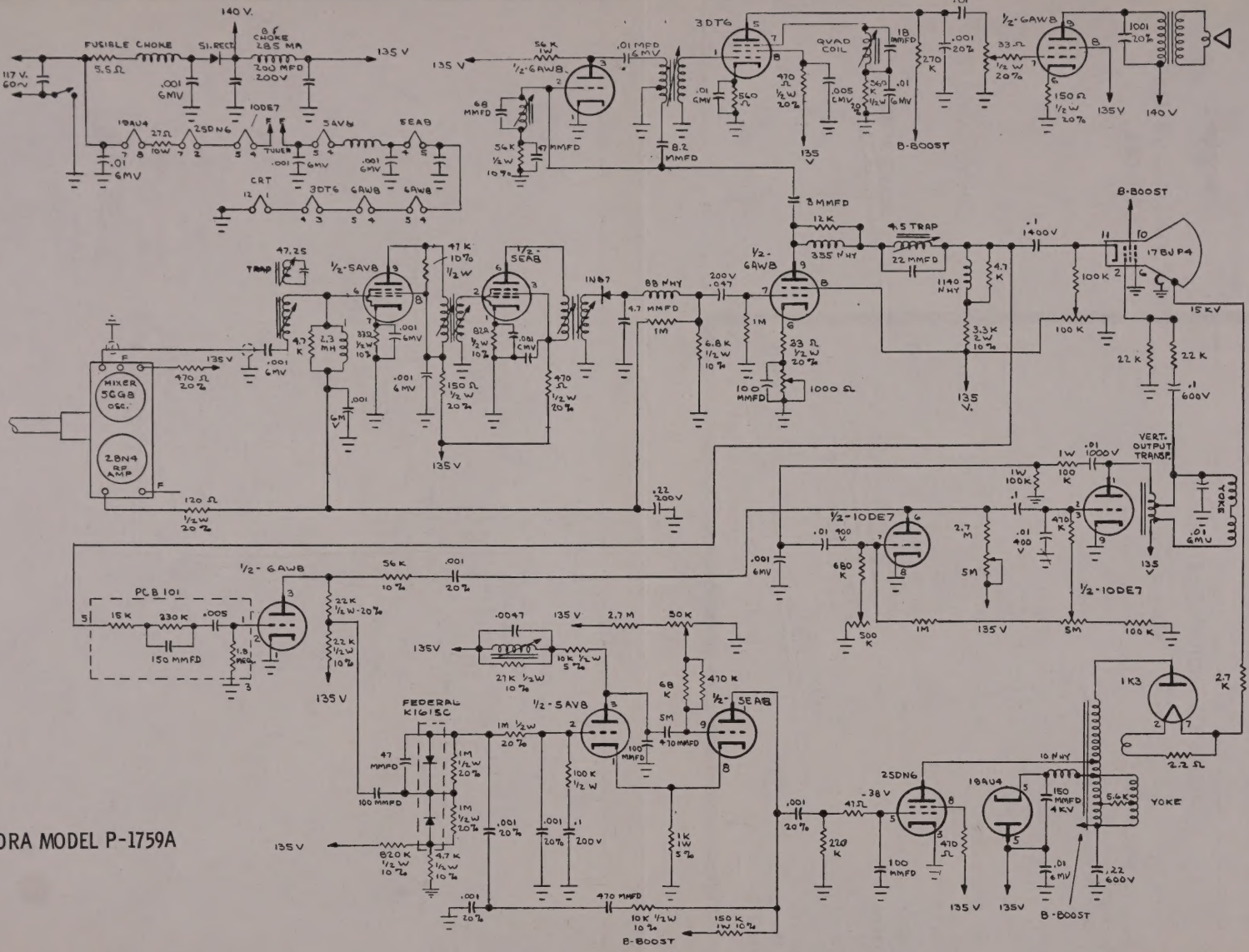
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

## IN THIS ISSUE OF THE SERVICER:

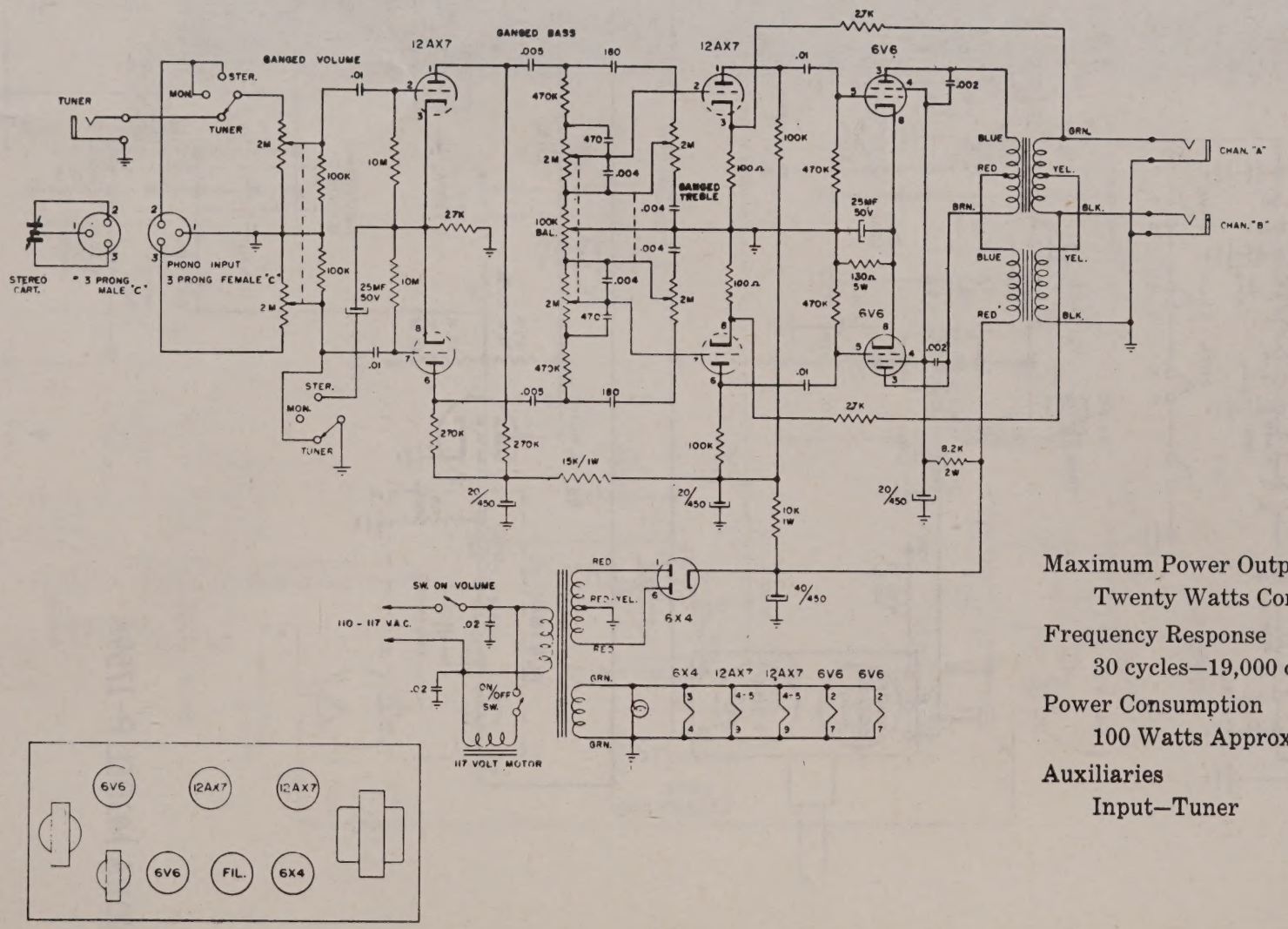
Columbia Model
HF-3

Sonora Model
P-1759A




SONORA MODEL P-1759A

Schematic Diagram Courtesy of Sonora Electronics




Maximum Power Output
Twenty Watts Combined

Frequency Response
30 cycles—19,000 cycles

Power Consumption
100 Watts Approximately

Auxiliaries
Input—Tuner

## COLUMBIA MODEL HF-3

Schematic Diagram Courtesy of Columbia Broadcasting System

PHOTOFACT® Folder with CIRCUITRACE*

# PACKARD-BELL MODEL 21DC16 (Ch. 98D6)

PACKARD-BELL MODEL 21DC16 (Ch. 98D6)

MODEL 21DC16 (Ch. 98D6)

| | | | |
|---|---|---|---|
| TRADE NAME | Packard-Bell | MODEL | CHASSIS |
| | | 21DC16 ..... | 98D6 |
| | | (Control Chassis) ..... | WRC-2 |
| | | (Remote Control Receiver) .. | WRR-2 |
| | | (Remote Control Transmitter) | WRT-2 |
| MANUFACTURER | Packard-Bell Electronics Corp., 1920 So. Figueroa St., Los Angeles 7, Calif. | | |
| TYPE SET | Television Receiver with Remote Control | | |
| TUBES | TV-Twenty-one, Remote Control Receiver-Five | | |
| TRANSISTORS | Remote Control Transmitter-Three | | |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycle | RATING | 292 Watts, 2.71 Amp. @ 117 Volts AC (While Tuning)<br>257 Watts, 2.4 Amp. @ 117 Volts AC (Not Tuning) |
| TUNING RANGE | Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) | | |

## SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Press glass back firmly - bottom center. Insert business card between glass and trim strip - left of center. Slide a card to right to depress spring. Lift trim strip straight up. Remove glass by pulling tabs out - bottom edge.

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the rear cover.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

SYNC STABILITY

Sync stability may be varied by means of an ANI control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive control. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

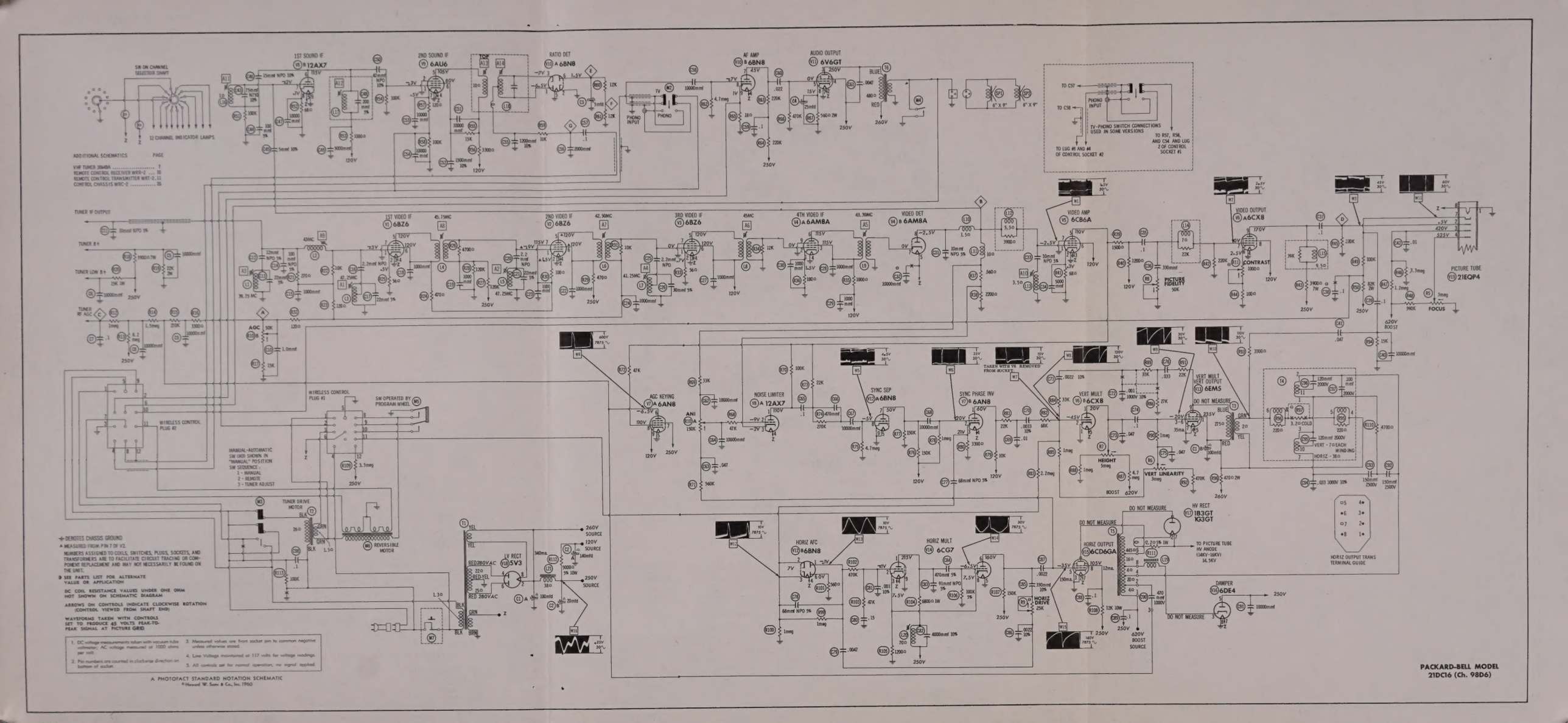
**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JA756



SET 476 FOLDER 1


1ST SOUND IF V5 12AX7
2ND SOUND IF V9 6AU6
RATIO DET V10 6BN8
AF AMP V10 6BN8
AUDIO OUTPUT V11 6V6GT
SW ON CHANNEL SELECTOR SHAFT
12 CHANNEL IND ICATOR LAMPS
PHONO INPUT
TV
PHONO
BLUE
RED
6" X 9"
TO CS7
TO CS8
PHONO INPUT
TV-PHONO SWITCH CONNECTIONS USED IN SOME VERSIONS
TO LUG #5 AND #4 OF CONTROL SOCKET #2
TO R57, R58, AND C54 AND LUG 2 OF CONTROL SOCKET #1
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TUNER B+
TUNER LOW B+
TUNER RF AGC
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 6BZ6
4TH VIDEO IF V4 A 6AM8A
VIDEO DET V4 B 6AM8A
VIDEO AMP V5 6CB6A
VIDEO OUTPUT V6 A6CX8
PICTURE FIDELITY 50K
CONTRAST 1000Ω
PICTURE TUBE V19 21EQP4
FOCUS 3meg
620V BOOST
AGC 50K
AGC KEYING V7 A 6AN8
ANI 150K
NOISE LIMITER V8 A 12AX7
SYNC SEP V12 A 6BN8
SYNC PHASE INV V7 B 6AN8
TAKEN WITH V8 REMOVED FROM SOCKET
VERT MULT V6 B 6CX8
VERT MULT VERT OUTPUT V13 6EM5
DO NOT MEASURE
HEIGHT 5meg
VERT LINEARITY 3meg
BOOST 620V
VERT - 7 Ω EACH WINDING
HORIZ - 38 Ω
HORIZ OUTPUT TRANS TERMINAL GUIDE
WIRELESS CONTROL PLUG #1
WIRELESS CONTROL PLUG #2
SW OPERATED BY PROGRAM WHEEL MS
MANUAL-AUTOMATIC SW (MS) SHOWN IN "MANUAL" POSITION
SW SEQUENCE :
1 - MANUAL
2 - REMOTE
3 - TUNER ADJUST
TUNER DRIVE MOTOR M6
REVERSIBLE MOTOR
HORIZ AFC V12 B 6BN8
HORIZ MULT V14 6CG7
HORIZ OUTPUT V15 6CD6GA
HORIZ DRIVE 25K
HV RECT V17 1B3GT 1G3GT
TO PICTURE TUBE HV ANODE (18KV-16KV) 14.5KV
DAMPER V16 6DE4
LV RECT V18 5V3
260V SOURCE
120V SOURCE
250V SOURCE
620V BOOST SOURCE
DENOTES CHASSIS GROUND
MEASURED FROM PIN 7 OF V2.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 45 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE GRID
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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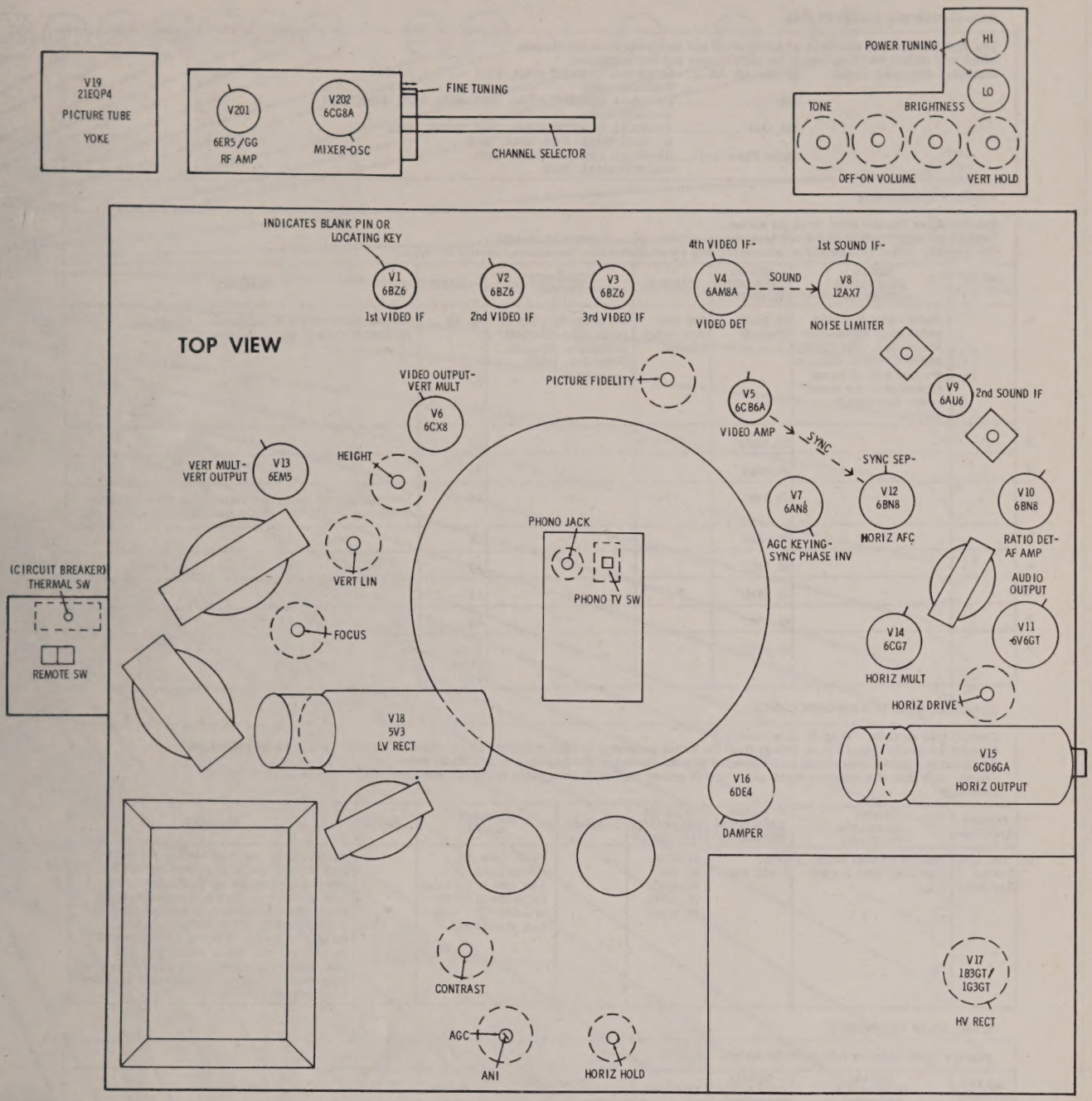
PACKARD-BELL MODEL 21DC16 (Ch. 98D6)

# TV
# TUBE PLACEMENT CHART




# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, V18

SWEEP FAILURE
No raster, has sound V14, V15, V16, V17, V19
No vertical deflection V6, V13
Poor vert. linearity or foldover V6, V13
Poor horiz. linearity or foldover V14, V15
Narrow picture V14, V15, V16, V18
Vert. off freq. V6
Horiz. off freq. V12, V14

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V5, V6, V19
Has pic, no sound V8, V9, V10, V11
Overloaded picture V7

SYNC FAILURE
No vert. sync V12, V7
No horiz. sync V12, V7
No vert. or horiz. sync V12, V7

PACKARD-BELL MODEL 21DC16 (Ch. 98D6)

FOLDER 1

# TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:

| | |
|---|---|
| A1 thru A9, A11 .... | GENERAL CEMENT #8721, 8722<br>WALSCO #2519 |
| A10 ..... | GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987<br>WALSCO #2531 |
| A13, A14 ..... | GENERAL CEMENT #8282, 8606, 8606L, 9295<br>WALSCO #2526, 2543, 2544, 2545 |
| Mixer Plate Coil ... | GENERAL CEMENT #9296. 9297<br>WALSCO #2546, 2547 |

VIDEO IF ALIGNMENT

Remove Noise Limiter tube from its socket.
Connect the negative lead of a 6 volt bias supply to point (A). Positive to chassis.
The geneator output lead should be terminated with its characteristic impedance, usually 50 ohms.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | | Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis. | 47.25MC (Unmod) | Any non-interfering channel | DC probe thru 10K to point (B). Common to chassis. (Across Video Det. load) | A1, A2 | Set generator output at maximum. Adjust for MINIMUM deflection. |
| 2. | | " | 39.75MC | " | " | A3 | " |
| 3. | | " | 41.25MC | " | " | A4 | " |
| 4. | | " | 43.3MC | " | " | A5 | Use only enough generator output to provide a usable indication on VTVM. Adjust for maximum deflection. |
| 5. | | " | 45.0MC | " | " | A6 | " |
| 6. | | " | 42.5MC | " | " | A7 | " |
| 7. | | " | 45.75MC | " | " | A8 | " |
| 8. | | " | 43.0MC | " | " | A9 | " |
| 9. | | " | 45.0MC | " | " | Mixer Plate Coil | " |

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect high side of a separate signal generator to ground lead of IF input cable to provide markers. DO NOT connect low side of generator.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 10. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 63MC (10MC Swp) | 41.25MC<br>43.0MC<br>45.0MC<br>45.75MC<br>47.25MC | 3 | Vert. Amp. thru 22K to point (B). Low side to chassis. DC probe of VTVM to point (C). Common to chassis. | | Adjust sweep output to develop -4 volts or less on AGC line as indicated by VTVM. Check for response curve similar to Fig. 1 with markers as shown. If necessary, retouch Mixer Plate Coil to position 45.75MC marker at 50%, A7 to position 43.0MC marker at corner of curve and A8 and A5 for correct tilt, dip or hump. A8 will affect higher frequency part and A5 the lower frequency. Replace the Noise Limiter tube in its socket. |

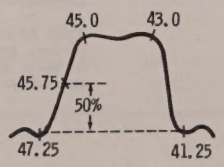
4.5MC TRAP ALIGNMENT

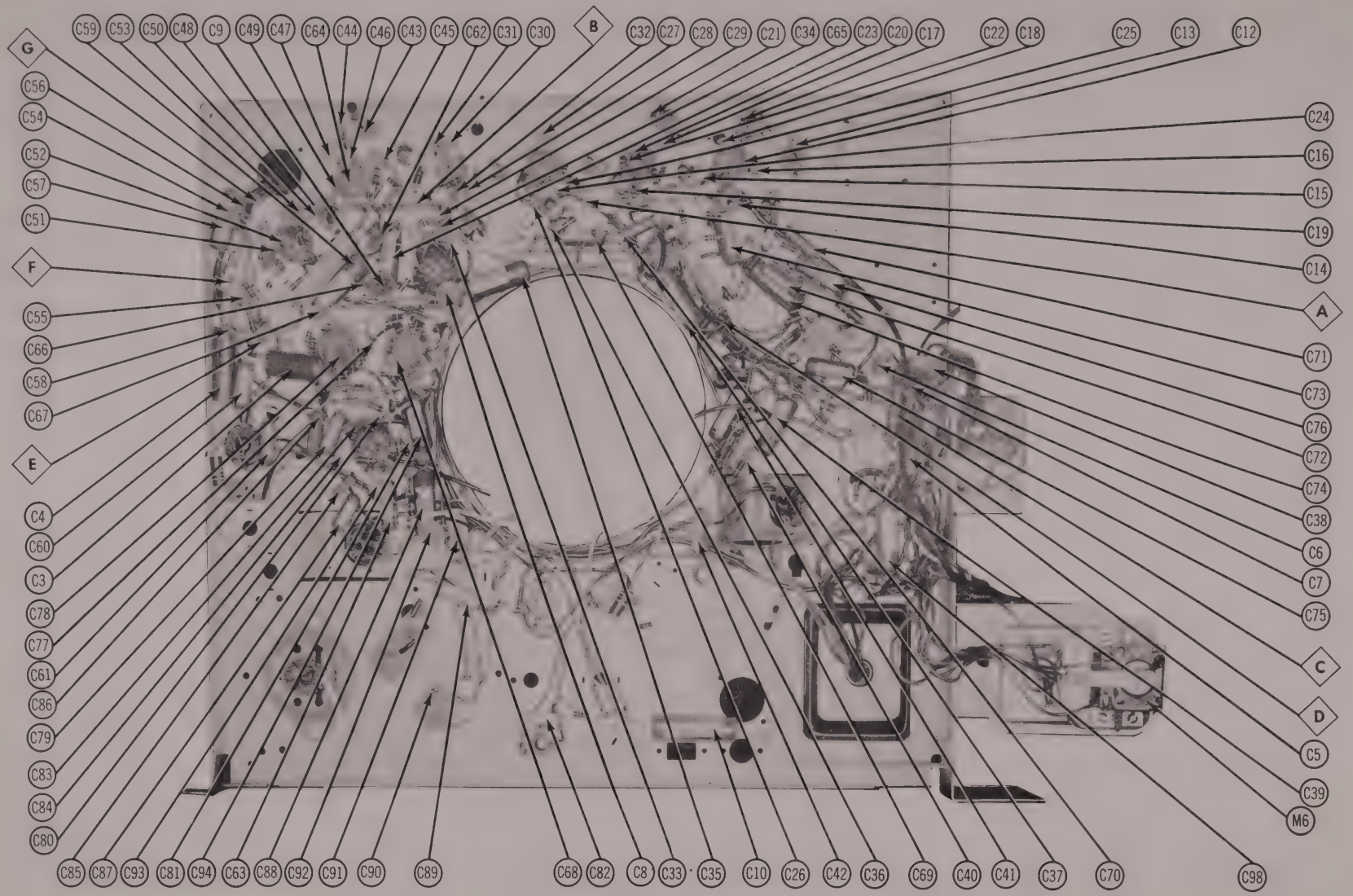
Remove Video Detector tube from its socket.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 11. | .01mfd | High side to point (B). Low side to chassis. | 4.5MC (Unmod) | Any non-interfering channel | RF probe to point (D). Common to chassis. | A10 | Adjust for MINIMUM deflection. Replace Video Det. tube in its socket. |

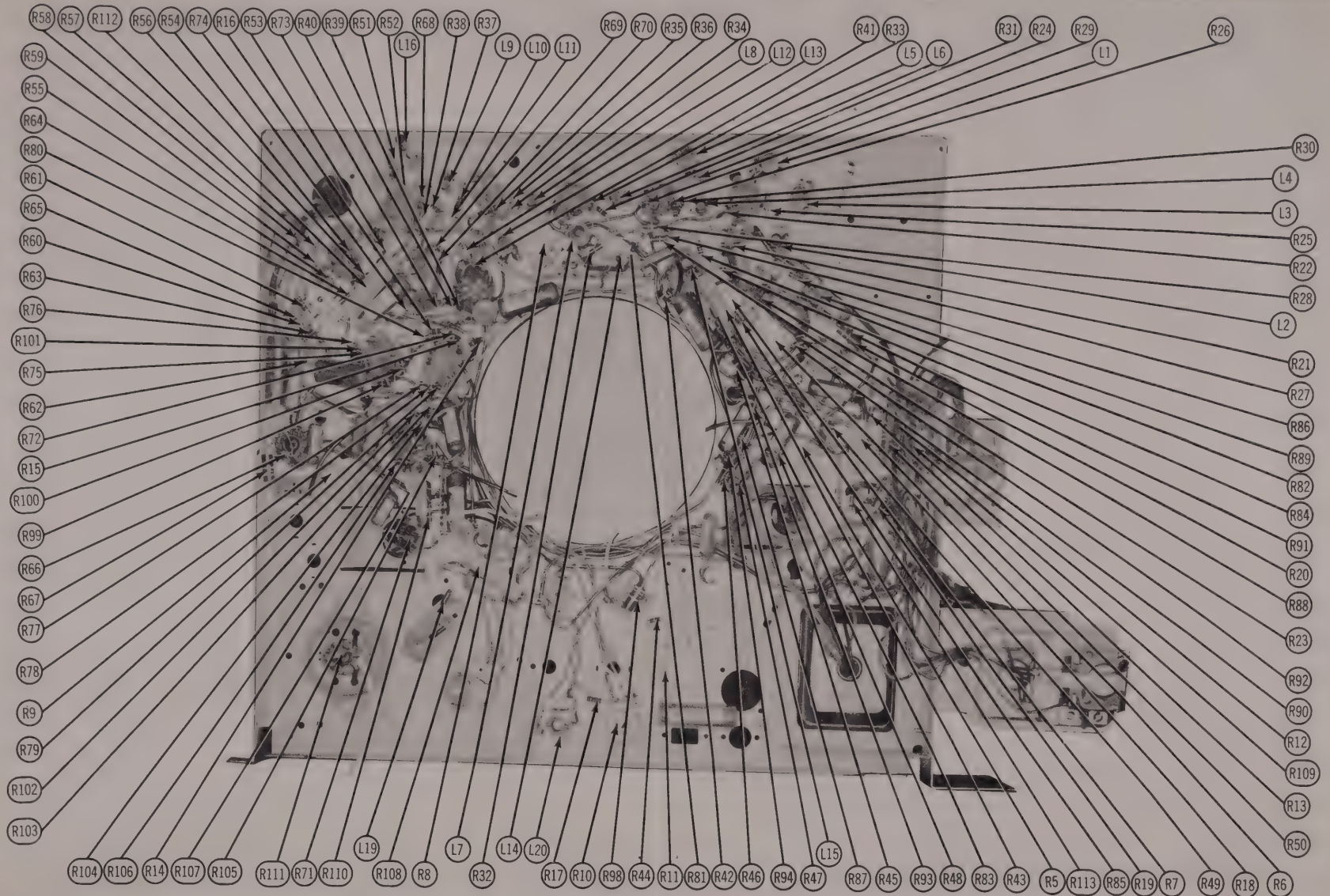
SOUND IF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 12. | .01mfd | High side to point (B). Low side to chassis. | 4.5MC (Unmod) | Any non-interfering channel | DC probe to point (E). Common to chassis. | A11, A12, A13 | Adjust for maximum deflection. |
| 13. | " | " | " | " | DC probe to point (F). Common to point (G). | A14 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

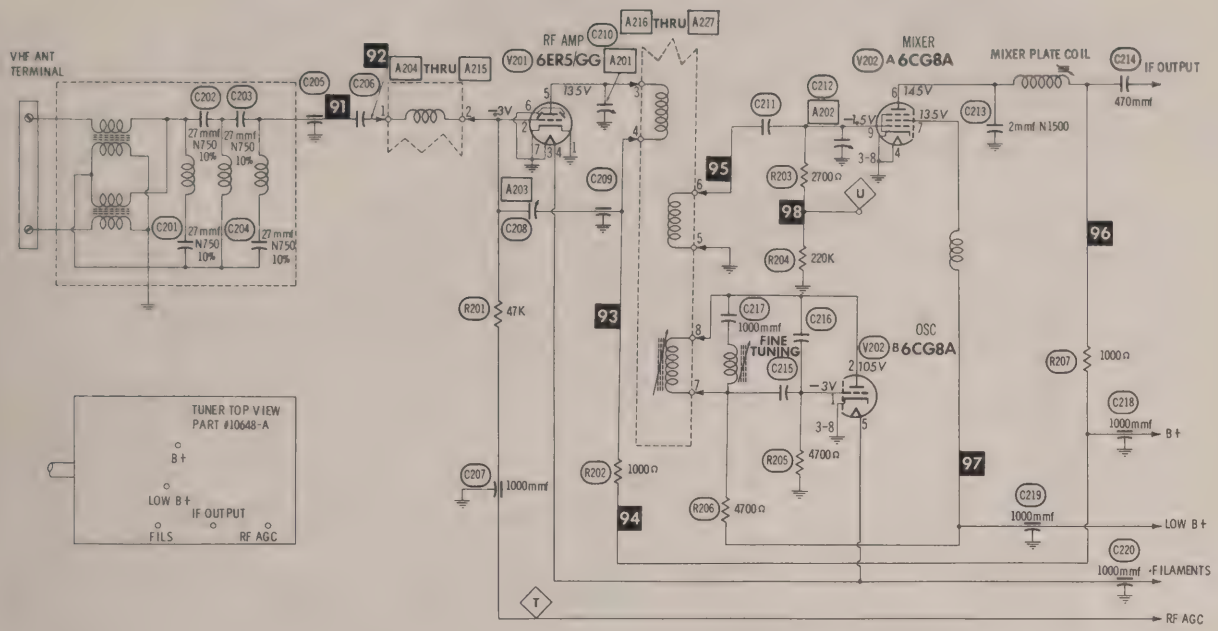





TV CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION




TV CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION




A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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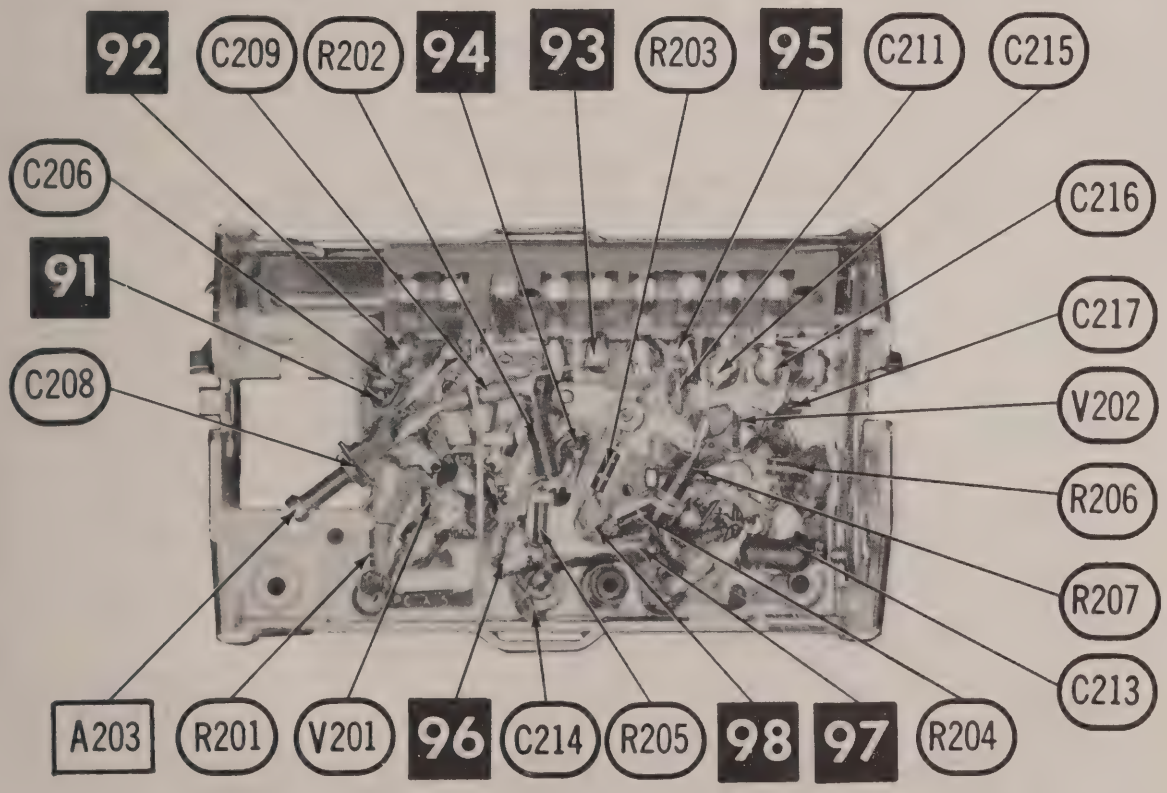
## VHF TUNER 10648A




A Howard W. Sams CIRCUITRACE Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

## TUNER 10648A - BOTTOM VIEW

# TUNER PARTS LIST AND DESCRIPTIONS

## TUBES

| • CBS • | | GENERAL ELECTRIC • | | RAYTHEON • | | SYLVANIA • | |
|---|---|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | | ITEM No. | USE | TYPE |
| V201 | RF Amplifier | 6ER5/GG | | V202 | Mixer - Oscillator | 6CG8A |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C201 | 27 N750 10% | | N750-DI 25 | TCN-27 | C10Q27U | CCTN-270 | CN7-427 | 10TCU-Q27 |
| C202 | 27 N750 10% | | N750-DI 25 | TCN-27 | C10Q27U | CCTN-270 | CN7-427 | 10TCU-Q27 |
| C203 | 27 N750 10% | | N750-DI 25 | TCN-27 | C10Q27U | CCTN-270 | CN7-427 | 10TCU-Q27 |
| C204 | 27 N750 10% | | N750-DI 25 | TCN-27 | C10Q27U | CCTN-270 | CN7-427 | 10TCU-Q27 |
| C205 | | | | | | | | |
| C206 | | | | | | | | |
| C207 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C208 | | | | | | | | |
| C209 | | | | | | | | |
| C210 | | | | | | | | |
| C211 | | | | | | | | |
| C212 | | | | | | | | |
| C213 | 2 N1500 | | | | | | | |
| C214 | 470 | | BPD-00047 | DD-471 | BYA10T47 | CCD-471 | GP347 | 5GA-T47 |
| C215 | | | | | | | | |
| C216 | | | | | | | | |
| C217 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C218 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C219 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C220 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |

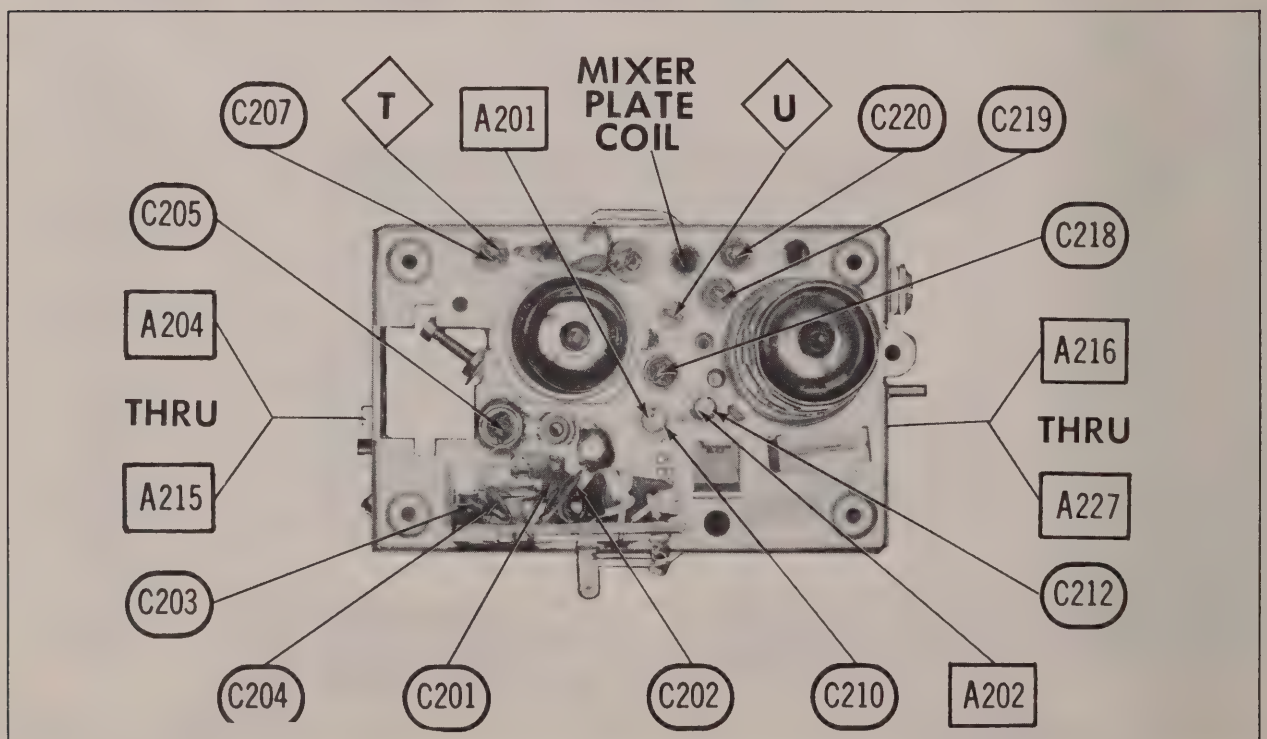
## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R201 | 47K | |
| R202 | 1000Ω | |
| R203 | 2700Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R204 | 220K | |
| R205 | 4000Ω | |
| R206 | 4700Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R207 | 4700Ω | |




TUNER 10648A TOP VIEW

# REMOTE CONTROL
# ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: A1 thru A9, A13 . GENERAL CEMENT #8721, 8722
WALSCO #2519
A10, A11, A12 ... GENERAL CEMENT #9087, 9089
WALSCO #2528

ALIGNMENT INSTRUCTIONS FOR REMOTE CONTROL RECEIVER WRR-2

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | High side of Audio Oscillator thru 10mmf to point (H). Low side to chassis. (Leave microphone attached. Keep oscillator output low enough that VTVM reads no more than 1.5 volts). | 41.5KC | | DC probe to point (I). Common to chassis. | A15, A16 | Adjust for maximum deflection. |
| 2. | " | 38.0KC | | " | A17 | " |
| 3. | High side to point (J). Low side to chassis. (Keep VTVM reading below 1.5 volts as before). | 1.25KC | | DC probe to point (K). Common to point (L). | A18 | " |
| 4. | " | 2.0KC | | DC probe to point (M). Common to point (L). | A19 | " |
| 5. | " | 2.75KC | | High side to point (N). Common to point (O). | A20 | " |
| 6. | " | 3.5KC | | High side to point (P). Common to point (O). | A21 | " |

BIAS AND DRIVE ADJUSTMENTS FOR REMOTE CONTROL RECEIVER WRR-2

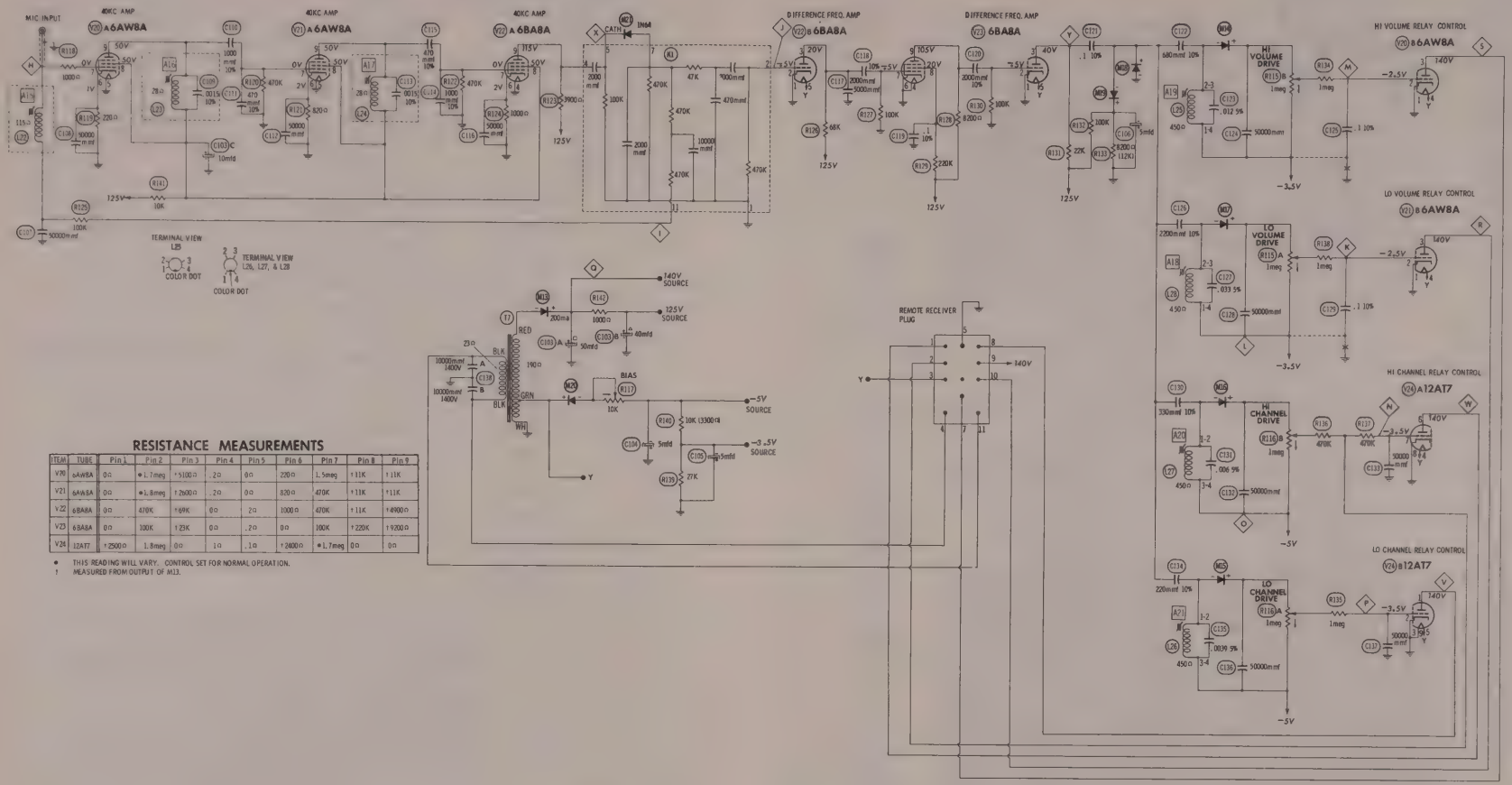
Drive controls (R115B, R116A, R116B and R115A) should be set fully clockwise. Connect DC probe of VTVM to point (P). Common to chassis. Adjust R117 for -3 volts. Connect DC probe of VTVM to point (R) and common to point (Q). Voltage should be about 1 volt. If it is 1.5 volts or more change V21 for a tube that provides a reading of about 1 volt. Remove DC probe from point (R) and measure voltages at points (S), (V) and (W). These should also read about 1 volt and the tube concerned replaced if any reading exceeds 1.5 volts.

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 7. | High side to point (J). Low side to chassis. | 1.25KC @ 6MV. | | DC probe to point (R). Common to point (Q). | R115A | Adjust for negative 6 volts. |
| 8. | " | 2.0KC @ 6MV. | | DC probe to point (S). Common to point (Q). | R115B | Adjust for negative 14 volts. |
| 9. | " | 2.75KC @ 2MV. | | DC probe to point (W). Common to point (Q). | R116B | Adjust for negative 5.5 volts. |
| 10. | " | 3.5KC @ 2MV. | | DC probe to point (V). Common to point (Q). | R116A | " |

ALIGNMENT INSTRUCTIONS FOR REMOTE CONTROL TRANSMITTER WRT-2

The receiver is used during alignment of transmitter. Keep both horizontal and vertical sweep of scope at about 3/4 diameter of scope tube.

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 11. | Connect Audio Oscillator to horizontal input of scope. | 41.5KC | | Vert. Amp. to point (X). Low side to chassis. | A22 | Preset slug of A23 fully into printed board. Press Volume Lo and adjust A22 for zero beat on scope. |
| 12. | " | 41.0KC | | " | A23 | Press Channel Lo and adjust A23 for zero beat. |
| 13. | " | 500~ | | Vert. Amp. to point (Y). Low side to chassis. | | Retouch SLIGHTLY A23 for zero beat on scope. |
| 14. | " | 1.25KC | | " | A24 * | Press Volume off and adjust for zero beat. |
| 15. | " | 2.0KC | | " | A25 * | Press Volume on and adjust for zero beat. |
| 16. | " | 2.75KC | | " | A26 | Press Channel Hi and adjust for zero beat. |
| 17. | " | " | | " | A27 | Press Channel Hi and adjust for maximum output at 100% modulation (greatest difference between peak and troughs). |
| 18. | Connect Audio Oscillator to horizontal input of scope. | 3.5KC | | Vert. Amp. to point (Y). Low side to chassis. | | If not at zero beat, repeat steps 13 thru 16. |
| | * If either trimmer (A24 or A25) becomes too tight while adjusting for zero beat, change frequency in step 11 to 42.5KC and in step 12 to 42.0KC. Then repeat steps 11 thru 17. If either trimmer (A24 or A25) is too loose, reduce frequency in steps 11 and 12 to 40.5KC and 40.0KC. Repeat steps 11 thru 17. | | | | | |
| 19. | | | | Vert. Amp. to point (Z). Low side to chassis. | | Press Channel Lo. and retouch A27 for maximum modulation. |




## RESISTANCE MEASUREMENTS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V20 | 6AW8A | 0Ω | •1.7meg | †5100Ω | 2Ω | 0Ω | 2200Ω | 1.5meg | †11K | †11K |
| V21 | 6AW8A | 0Ω | •1.8meg | †2600Ω | 2Ω | 0Ω | 820Ω | 470K | †11K | †11K |
| V22 | 6BA8A | 0Ω | 470K | †69K | 0Ω | 2Ω | 1000Ω | 470K | †11K | †4900Ω |
| V23 | 6BA8A | 0Ω | 100K | †23K | 0Ω | .2Ω | 0Ω | 100K | †220K | †9200Ω |
| V24 | 12AT7 | †2500Ω | 1.8meg | 0Ω | 1Ω | .1Ω | †2400Ω | •1.7meg | 0Ω | 0Ω |

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M13.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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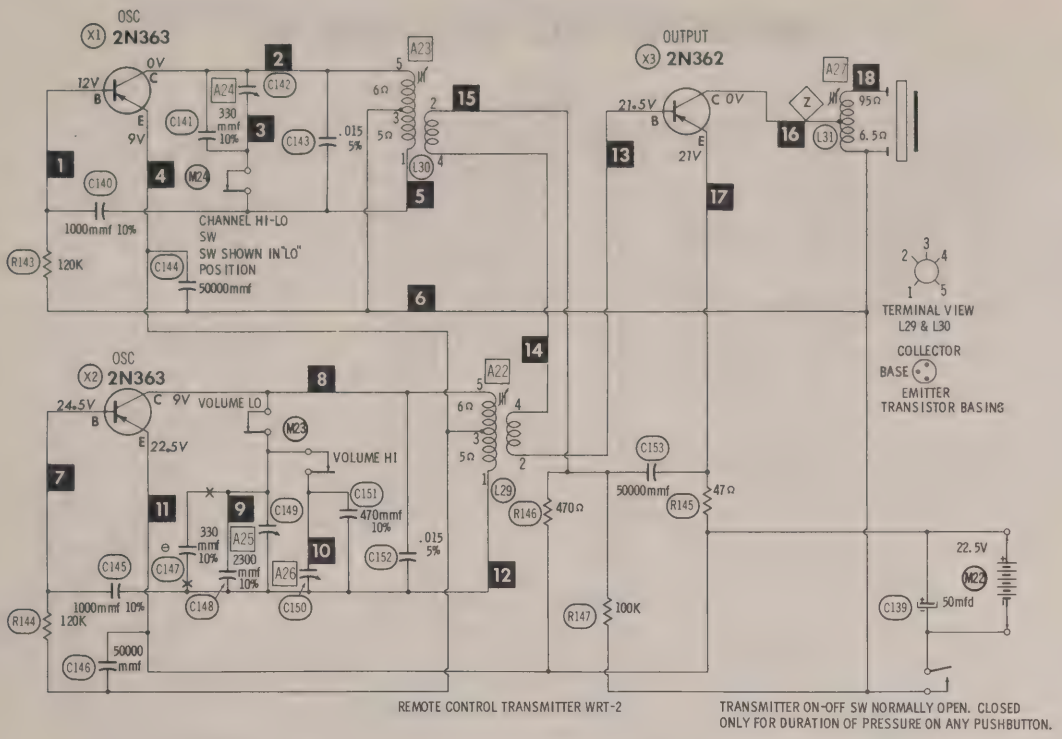
# REMOTE CONTROL RECEIVER WRR-2




A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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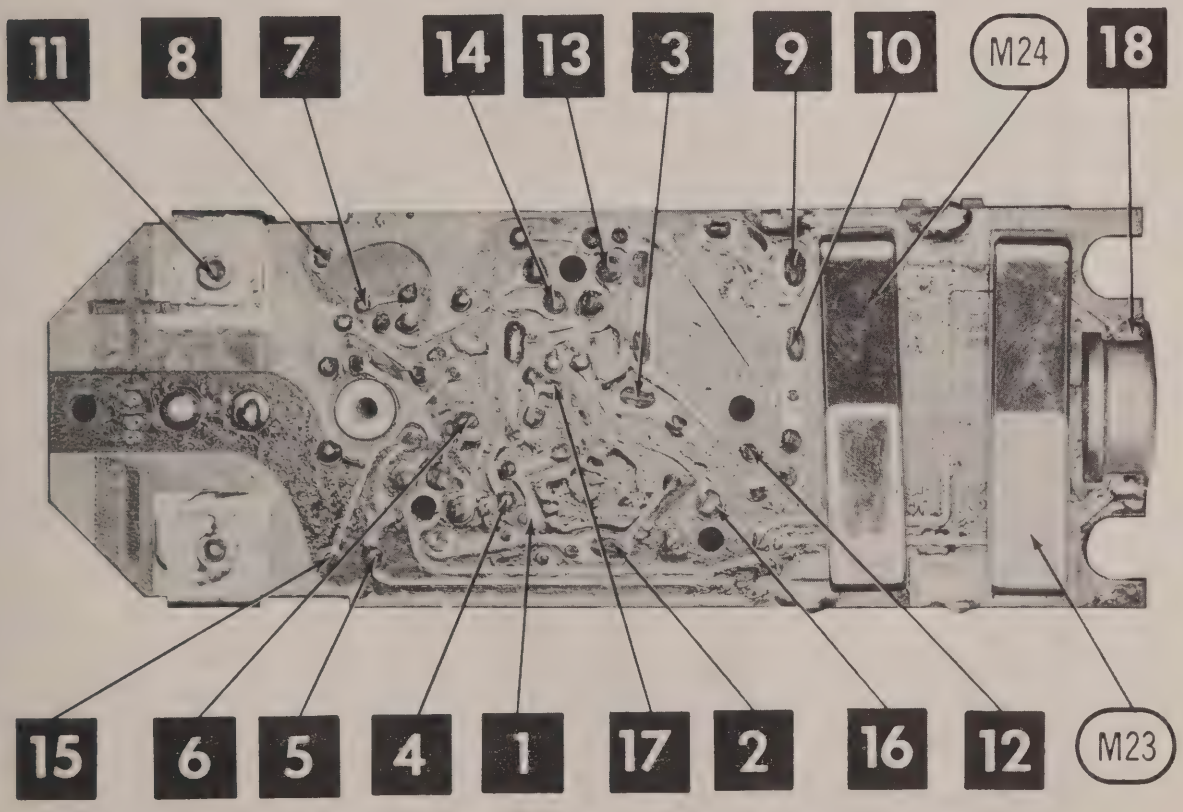
## REMOTE CONTROL TRANSMITTER - WRT-2




A Howard W. Sams CIRCUITRACE® Photo

## REMOTE CONTROL TRANSMITTER WRT-2 - BOTTOM VIEW

# TV
# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
|---|---|---|---|---|---|
| V1 | 1st Video IF Amp. | 6BZ6 | V9 | 2nd Sound IF | 6AU6 |
| V2 | 2nd Video IF Amp. | 6BZ6 | V10 | Ratio Det.-AF Amp. | 6BN8 |
| V3 | 3rd Video IF Amp. | 6BZ6 | V11 | Audio Output | 6V6GT |
| V4 | 4th Video IF Amp.-Video Det. | 6AM8A | V12 | Sync Sep.-Horiz. AFC | 6BN8 |
| V5 | Video Amp. | 6CB6A | V13 | Vert. Mult.-Vert. Output | 6EM5 |
| V6 | Video Output-Vert. Mult. | 6CX8 | V14 | Horiz. Mult. | 6CG7 |
| V7 | AGC Keying-Sync Phase Inv. | 6AN8 | V15 | Horiz. Output | 6CD6GA |
| V8 | 1st Sound IF-Noise Limiter | 12AX7 | V16 | Damper | 6DE4 |
| | | | V17 | HV Rect. | 1B3GT/1G3GT |
| | | | V18 | LV Rect. | 5V3 |

## PICTURE TUBE

| ITEM No. | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|
| | Packard-Bell PART No. | GENERAL ELECTRIC PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| V19 | 21EQP4 | | 21EQP4 ① | | 21EQP4 ② | ① Aluminized<br>② "Silver Screen 85" |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | Packard-Bell PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1A | ▲100 | 350 | 24166 | AFH2-41-50 | B0332 | FP227.7 | TMS-61 | TVL-2641 | |
| B | ▲100 | 350 | | | | | TD-100-450 | | |
| C2A | ▲140 | 350 | 24158 | AFH3-29-75 | D0044 | FP228.3 | TMS-62 | TVLS-2642 * | |
| B | ▲20 | 350 | | | | | TD-20-350 | | |
| C3 | 5 | 50 | 24038 | PRS1310 | BBR5-50 | TT50X5 | TD-5-50 | TVA-1303 | |
| C4 | 25 | 25 | 24006A | PRS1260 | BBR25-25 | TC26 | TD-25-25 | TVA-1205 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C5 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C6 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C7 | .1 200V | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |
| C8 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C9 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C10 | 1.0 100V | | P288N-1.0 | | CUB2W1 | | GEM-21 | 2TM-M1 |
| C11 | 10 NPO 5% | | NPO-DI 10 | DTZ-10 | C10Q1C | CM-20B-100J | CNO-410 | 10TCC-Q10 |
| C12 | 12 NPO 5% | | | TCZ-12 | C10Q12C | CM-20B-120J | CNO-412 | 10TCC-Q12 |
| C13 | 22 5% | | 1469-00022 | TCZ-22 | 22R5Q22 | CM-20B-220J | CNO-422 | MS-422 |
| C14 | 100 NPO 5% | | | TCZ-100 | C10T1C | CM-20B-101J | CNO-310 | 10TCC-T10 |
| C15 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C16 | 2.2 NPO | | NPO-DI 2.2 | DTZ-2R2 | C10V22C | CCTO-2R2 | CNO-522 | 10TCC-V22 |
| C17 | 22 5% | | 1469-000022 | DTZ-22 | 22R5Q22 | CM-20B-220J | CNO-422 | MS-422 |
| C18 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C19 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C20 | 2.2 NPO | | NPO-DI 2.2 | DTZ-2R2 | C10V22C | CCTO-2R2 | CNO-522 | 10TCC-V22 |
| C21 | 22 5% | | 1469-000022 | TCZ-22 | 22R5Q22 | CM-20B-220J | CNO-422 | MS-422 |
| C22 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C23 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C24 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C25 | 2.2 NPO | | NPO-DI 2.2 | DTZ-2R2 | C10V22C | CCTO-2R2 | CNO-522 | 10TCC-V22 |
| C26 | 30 5% | | 1469-00003 | TCZ-30 | 22R5Q3 | CCTO-300 | CNO-433 | MS-43 |
| C27 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C28 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C29 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C30 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C31 | 10 NPO 5% | | NPO-DI 10 | DTZ-10 | C10Q1C | CM-20B-100J | CNO-410 | 10TCC-Q10 |
| C32 | 10000 | Note 1 | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C33 | 10 NPO 5% | | NPO-DI 10 | DTZ-10 | C10Q1C | CM-20B-100J | CNO-410 | 10TCC-Q10 |
| C34 | 5000 | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C35 | .1 600V | | P688N-1 | DF-104 | CUB6P1 | 6DP-4-104 | GEM-601 | 6TM-P1 |
| C36 | 330 | | DI-330 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C37 | .1 600V | | P688N-1 | DF-104 | CUB6P1 | 6DP-4-104 | GEM-601 | 6TM-P1 |
| C38 | .1 400V | Note 1 | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C39 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C40 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C41 | .047 600V | | P688N-047 | DD-503 | CUB6S47 | 6DP-3-473 | GEM-6147 | 6TM-S47 |
| C42 | .01 600V | | P688N-01 | D6-103 | CUB6S1 | 6DP-2-103 | GEM-611 | 6TM-S1 |
| C43 | 75 N750 10% | | NPO-DI 75 | DTN-75 | C10Q75U | CCTN-750 | CN7-475 | 10TCU-Q75 |
| C44 | 100 5% | | | TCZ-100 | C10T1C | CM-20B-101J | CNO-310 | 10TCC-T10 |
| C45 | 5 10% | | NPO-SI 5.0 | D6-050 | C10V5C | CCD-050 | CNO-550 | 10TS-V5 |
| C46 | 15 NPO 10% | | NPO-DI 15 | DTZ-15 | C10Q15C | CCTO-150 | CNO-415 | 10TCC-Q15 |
| C47 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP250 | 5HK-S10 |
| C48 | 200 5% | | 1469-0002 | TCZ-200 | 22R5T2 | CM-20B-201J | MCE237 | MS-32 |
| C49 | 5000 | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C50 | 47 NPO 10% | | NPO-DI 47 | DTZ-47 | C10Q47C | CCTO-470 | CNO-447 | 10TCC-Q47 |
| C51 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C52 | 1500 10% | | DI-1500 | DD-152 | PM6D15 | CCD-152 | GP215 | 10TS-D15 |
| C53 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C54 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C55 | 1200 10% | | DI-1200 | DD-122 | 1R5D12 | CCD-122 | GP212 | 10TS-D12 |

# PARTS LIST AND DESCRIPTIONS (Continued)

## FIXED CAPACITORS (cont)

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C56 | 2000 | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C57 | .1 200V | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-601 | 2TM-P1 |
| C58 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C59 | .1 600V | | P688N-1 | DF-104 | CUB6P1 | 6DP-4-104 | GEM-601 | 6TM-P1 |
| C60 | .022 400V | | P488N-022 | DD-203 | CUB4S22 | 4DP-2-223 | GEM-4122 | 4TM-S22 |
| C61 | .0047 600V | | P688N-0047 | D6-472 | CUB6D47 | 6DP-1-472 | GEM-6247 | 6TM-D47 |
| C62 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C63 | .047 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C64 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C65 | .1 200V | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |
| C66 | 470 | | SI 470 | DD-471 | BYA10T47 | CCD-471 | GP347 | 10TS-T47 |
| C67 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C68 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C69 | .01 600V | | P688N-01 | D6-103 | CUB6S1 | 6DP-2-103 | GEM-611 | 6TM-S1 |
| C70 | .0033 600V 10% | | V84C6D33-10% | | PM6D33 | 6DP-1-332 | GEM-16233 | 6TM-D33 |
| C71 | .0022 400V 10% | | V84C4Q22-10% | | PM6D22 | 6DP-1-222 | JL-222 | 6TM-D22 |
| C72 | .001 1000V 10% | | P1084CM-0012 | DD-102 | | 16DP-1-102 | GEM-1621 | 10TM-D1 |
| C73 | .047 600V | | P688N-047 | DD-503 | CUB6S47 | 6DP-3-473 | GEM-6147 | 6TM-S47 |
| C74 | .1 600V | | P688N-1 | DF-104 | CUB6P1 | 6DP-4-104 | GEM-601 | 6TM-P1 |
| C75 | .047 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C76 | .033 600V | | P688N-033 | DD-303 | CUB6S33 | 6DP-2-333 | GEM-6133 | 6TM-S33 |
| C77 | 68 NPO 5% | | | DTZ-68 | C10Q68C | CCTO-680 | CNO-468 | 10TCC-Q68 |
| C78 | 68 NPO 5% | | | DTZ-68 | C10Q68C | CCTO-680 | CNO-468 | 10TCC-Q68 |
| C79 | .0047 600V | | P688N-0047 | D6-472 | CUB6D47 | 6DP-1-472 | GEM-6247 | 6TM-D47 |
| C80 | .15 200V | | P288N-15 | | CUB2P15 | 2DP-3-154 | GEM-2015 | 2TM-P15 |
| C81 | .001 600V 10% | | V84C6D1-10% | | PM6D1 | 6DP-1-102 | GP210 | 6TM-D1 |
| C82 | 4000 10% | | 1464-004 | | 1R5D4 | CM-20B-392K | MCB463 | MS-24 |
| C83 | 91 NPO 5% | | | TCZ-91 | C10Q91C | CM-20B-910J | | MS-491 |
| C84 | 470 5% | | 1469-00047 | | 5R5T47 | CM-20B-471J | MCJ244 | MS-347 |
| C85 | 330 10% | | 1469-00033 | | 5R5T33 | CM-20B-331K | MCE241 | MS-333 |
| C86 | .0022 400V 10% | | V84C4D22-10% | | PM6D22 | 6DP-1-222 | GP222 | 6TM-D22 |
| C87 | .0022 600V | | P688N-0022 | D6-222 | CUB6D22 | 6DP-1-222 | GEM-6222 | 6TM-D22 |
| C88 | .1 600V | | P688N-1 | DF-104 | CUB6P1 | 6DP-4-104 | GEM-601 | 6TM-P1 |
| C89 | .1 600V | | P688N-1 | DF-104 | CUB6P1 | 6DP-4-104 | GEM-601 | 6TM-P1 |
| C90 | 470 1000V | | DI-470 | DD-471 | BYA10T47 | CCD-471 | GP347 | 10TS-T47 |
| C91 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C92 | 150 2500V | | HVD-30-150 | DD30-151 | HVB30T15 | 3CCD-151 | 6HV-315 | 30GA-T15 |
| C93 | 150 2500V | | HVD-30-150 | DD30-151 | HVB30T15 | 3CCD-151 | 6HV-315 | 30GA-T15 |
| C94 | .033 1000V 10% | | P1084CM-033 | | | 16DP-4-333 | GEM-1613 | 10TM-S33 |
| C95 | 120 2000V | | HVD-30-120 | DD30-121 | HVB20T12 | 3CCD-121 | 6HV-312 | 30GA-T12 |
| C96 | 120 2000V | | HVD-30-120 | DD30-121 | HVB20T12 | 3CCD-121 | 6HV-312 | 30GA-T12 |
| C97 | 100 2000V | | HVD-30-100 | DD30-101 | HVB20T1 | 3CCD-101 | 6HV-310 | 30GA-T10 |
| C98 | .1 600V | | P688N-1 | DF-104 | CUB6P1 | 6DP-4-104 | GEM-601 | 6TM-P1 |
| C99 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C100 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C101 | 1.0 100V | | P288N-1.0 | | CUB2W1 | | GEM-21 | 2TM-M1 |
| C102A | 10000 | | BPD-2X01 | DD2-103 | BYD6DS1 | CCD-103 | B2X110 | 5HK-2S10 |
| B | 10000 | | | | | CCD-103 | | |

Note 1. Not used in some versions.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | Packard-Bell PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1 | 500K | | 25993A | | | | | Volume |
| R2 | 500Ω | | 25527 | | | | | Tone |
| R3A | 50K | | 25906A | B-31 | A47-50K-S | Q11-123 | U35 | Brightness |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| R4A | 3meg | | 25984 | B-84 | A47-3meg-S | Q11-140 | U59 | Vert. Hold |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| R5A | 3meg | | 25867 | BX-84 | B47-3meg-S | B11-140 | SU-59 | Focus |
| B | Shaft | | | Not Req. | Not Req. | TM4 | Not Req. | |
| R6A | 3meg | | 25867 | BX-84 | B47-3meg-S | B11-140 | SU-59 | Vert. Lin. |
| B | Shaft | | | Not Req. | Not Req. | TM4 | Not Req. | |
| R7A | 5meg | | 25910 | AB-87 | B47-5meg-S | B11-141 | PTA56L | Height |
| B | Shaft | | | AK-1 | Not Req. | TM4 | Not Req. | |
| R8A | 50K | | 25946 | B-32 | A47-50K-Z | Q13-123 | U33 | Picture Fidelity |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| R9A | 25K | | 25857 | AB-26 | B47-25K-S | B11-120 | TA253L | Horiz. Drive, Note 1 |
| B | Shaft | | | AK-1 | Not Req. | TM4 | Not Req. | |
| R10A | 150K | | 25968 | F1-33 | | | | ANI |
| B | 50K | | | R2-29 | | † (Q)J-981 | ■ (U)E3912 | AGC |
| R11A | 1000Ω | | 25904A | B-505 | A47-1000-S | Q17-108 | U3 | Contrast, Note 2 |
| B | Shaft | | | Not Req. | FKS-1/4 | Not Req. | Not Req. | |

■ "STA-LOC" Equivalent: FB154L, RU54L, OS500, IS437.
† "Concentrikit" Equivalent: K-8 Kit with Base Elements & Shafts: B11-328, P19-012 (Panel)
(Not available as a factory assembled unit.) B11-123, R15-005 (Rear)
R-5 (Retainer)

Note 1. Some versions may use 50K in this application.
Note 2. Some versions may use 3000Ω in this application.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R12 | 1meg | |
| R13 | 8.2meg | |
| R14 | 1.5meg | |
| R15 | 270K | |
| R16 | 3300Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R17 | 15K | |
| R18 | 3900Ω 7W | |
| R19 | 22K 2W | |
| R20 | 15K 1W | |
| R21 | 270Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R22 | 10K | |
| R23 | 120Ω | |
| R24 | 470Ω | |
| R25 | 56Ω | |
| R26 | 4700Ω | |

# TV PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS (cont)

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R27 | 120K | |
| R28 | 120K | |
| R29 | 470Ω | |
| R30 | 100Ω | |
| R31 | 10K | |
| R32 | 120Ω | |
| R33 | 56Ω | |
| R34 | 12K | |
| R35 | 1000Ω | |
| R36 | 180Ω | |
| R37 | 560Ω | |
| R38 | 2200Ω | |
| R39 | 1300Ω | |
| R40 | 1200Ω | |
| R41 | 68Ω | |
| R42 | 220K | |
| R43 | 3900Ω 7W | |
| R44 | 100Ω | |
| R45 | 220K | |
| R46 | 3 1meg | |
| R47 | 1. 2meg | |
| R48 | 390K | |
| R49 | 100K | |
| R50 | 82K 2W | |
| R51 | 100K | |
| R53 | 68Ω | |
| R53 | 1000Ω | |
| R54 | 100K | |
| R55 | 15K | |
| R56 | 3300Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R57 | 120Ω | |
| R58 | 100K | |
| R59 | 10K | |
| R60 | 12K | |
| R61 | 12K | |
| R62 | 4 7meg | |
| R63 | 220K | |
| R64 | 220K | |
| R65 | 18Ω | |
| R66 | 470K | |
| R67 | 560Ω 2W | |
| R68 | 47K | |
| R69 | 33K | |
| R70 | 100K | |
| R71 | 560K | |
| R72 | 47K | |
| R73 | 22K | |
| R74 | 270K | |
| R75 | 4 7meg | |
| R76 | 150K | |
| R77 | 150K | |
| R78 | 1meg | |
| R79 | 10K | |
| R80 | 3300Ω | |
| R81 | 22K | |
| R82 | 68K | |
| R83 | 2 2meg | |
| R84 | 33K | |
| R85 | 1meg | |
| R86 | 27K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R87 | 4 7meg | |
| R88 | 1meg | |
| R89 | 33K | |
| R90 | 1meg | |
| R91 | 22K | |
| R92 | 470K | |
| R93 | 3300Ω | |
| R94 | 15K | |
| R95 | 220Ω | |
| R96 | 220Ω | |
| R97 | 3 2Ω Cold | Note 1. |
| R98 | 470Ω 2W | |
| R99 | 1meg | |
| R100 | 1meg | |
| R101 | 560Ω | |
| R102 | 470K | |
| R103 | 47K | |
| R104 | 6800Ω 1W | |
| R105 | 1200Ω | |
| R106 | 100K 5% | |
| R107 | 150K | |
| R108 | 12K 10W | |
| R109 | 3. 3meg | |
| R110 | 4700Ω | |
| R111 | 2. 2Ω 5% 1W | |
| R112 | 3000Ω 5% 10W | |
| R113 | 100K | |
| R114 | 68K | |

Note 1. Not used in some versions.

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA Packard-Bell PART No | Gremar PART No. | Meissner PART No | Merit PART No. | Miller PART No. | Rem PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| L1 | 39.75MC Trap | | 17-4534 | 17-4534 | TV-131 | | VF-4 | |
| L2 | 1st Video IF | | | | | | | |
| L3 | 47.25MC Trap | | 17-4523 | 17-4523 | TV-130 | 6219 | VF-3 | |
| L4 | 2nd Video IF | | | | | | | |
| L5 | 47.25MC Trap | | | | | | | |
| L6 | 3rd Video IF | | 17-4522 | 17-4522 | TV-130 | 6219 | VF-3 | |
| L7 | 41.25MC Trap | | | | | | | |
| L8 | 4th Video IF | | 17-4523 | 17-4523 | TV-130 | 6219 | VF-3 | |
| L9 | 5th Video IF | | 17-4523 | 17-4523 | TV-130 | 6219 | VF-3 | |
| L10 | RF Choke | | 19-1005 | 19-1005 | BC-586 | 6612 | | 10uh |
| L11 | Shunt Peaking Coil | | 19-3250 | 19-3250 | TV-185 | 6181 | VP-6 | 250uh |
| L12 | Series Peaking Coil | | 19-3083 † | 19-3083 † | TV-181 † | 6177 † | VP-3 † | 93uh ① |
| L13 | 4.5MC Trap | | 17-3403 | 17-3403 | | 1470 ▲ | | |
| L14 | Series Peaking Coil | | 19-4122 | 19-4122 | TV-183 | 6178 | VP-4 †† | 120uh ③ |
| L15 | Shunt Peaking Coil | | 19-4180 | 19-4180 | TV-183 | 6179 | VP-5 ■ | 180uh ③ |
| L16 | 1st Sound IF | | 17-3403 | 17-3403 | TV-119 | 1470 ▲ | | |
| L17 | 2nd Sound IF | | 17-3400 * | 17-3400 * | TV-151 * | 1469 * ▲ | SF-3 * | |
| L18 | Ratio Det. | | 17-3497 ▲ | 17-3497 ▲ | TV-115 ▲ | 6205 ▲ | SD-4 ▲ | |
| L19 | RF Choke | | | | | | | 12uh |

① Wound on 3900Ω resistor.
② Wound on 22K resistor.
③ Wound on 39K resistor.
† Parallel with 3900Ω resistor.
†† Parallel with 22K resistor.
■ Parallel with 39K resistor.
▲ Disregard tap.
* Use original shield.
▲ Use adaptor plate.

## TRANSFORMER (HORIZ. OSC.)

| ITEM No. | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA Packard-Bell PART No. | Halldorson PART No | Merit PART No. | Miller PART No. | Rem PART No. | Thordarson PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| L20 | 70Ω | | | HS-5 | TV-163 | 6210 | H-102 | HS-5 | Horiz. Stabilizer |

## FILTER CHOKE

| ITEM No | RATINGS CURRENT (Measured) | RATINGS DC RES. | RATINGS INDUCTANCE (@ CURRENT 1000 ^) | REPLACEMENT DATA Packard-Bell PART No. | Halldorson PART No. | Merit PART No. | Rem PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| L21 | .340A | 38Ω | .9 Hy. | 27006D | 26C44 ① | C-2896 ① | | C-2328 ① | 26C44 ① | C-27X |

③ Drill new mounting hole

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA Packard-Bell PART No. | Halldorson PART No. | Merit * PART No. | Rem PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V ④ 2.2A | 560VCT ③ .340A | 5V ④ 3.6A | 89076A | 26R92 ① | P-3055 ① | | P-8167 ③ | 26R92 ① | R-8LBC ② |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3V ② 11A | | | | | | | | | |

① Phase and parallel 10A and 4.5A filament windings.
② Phase and parallel 8A and 5A filament windings.
④ Phase and parallel 8.5A and 4.5A filament windings.

## TRANSFORMER (MOTOR)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA Packard-Bell PART No. | Halldorson PART No. | Merit PART No. | Rem PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T2 | 117V ④ .3A | 24V ④ 1.9A | | 89080B | | | | | | |

## TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No. | USE | REPLACEMENT DATA Packard-Bell PART No | Halldorson PART No | Merit PART No | Rem PART No | Rogers PART No | Stancor PART No | Thordarson PART No | Triad PART No |
|---|---|---|---|---|---|---|---|---|---|
| T3 | Vert Output | 89480B | 26S14 | | V319 | | VO-101 | 26S14 | A-113X |
| T4 | Yoke-Horiz.(18.6MH) (110°)-Vert. (15MH) | 29696 | Y-52 ①② | | Y-110 ①③ | | DY-27A ①② | Y-52 ①② | Y-60-2 ② |
| T5 | Horiz. Output | 89488A | | | | | | | D-92 * |

① Use original rear cover and centering device.
② Connect same as original.
③ Connect yoke terminal #2 to horizontal output transformer terminal #4, yoke #10 to capacitor C94.

### *HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

| ORIGINAL TERMINAL CONNECTIONS | Halldorson Replacement Connections | Merit Replacement Connections | Rem Replacement Connections | Rogers Replacement Connections | Stancor Replacement Connections | Thordarson Replacement Connections | Triad Replacement Connections |
|---|---|---|---|---|---|---|---|
| 6 | | | | | | | 8 |
| 8 | | | | | | | 6 |
| 4 | | | | | | | 5 |
| 2 | | | | | | | 4 |
| 1 | | | | | | | 1 |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. | REPLACEMENT DATA Packard-Bell PART No. | Halldorson PART No. | Merit PART No. | Rem PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T6 | 4500Ω | 3-4Ω | 89436D | 24S51 | A-2930 | AU-601 | A-3877 | 24S51 | S-3X | |

## SPEAKER

| ITEM No. | TYPE SIZE | TYPE FIELD | TYPE V. C. IMP. | REPLACEMENT DATA Packard-Bell PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 6" x 9" | PM | 6-8Ω | 53113 | 69AIZ6 | Parallel and phase |
| SP2 | 6" x 9" | PM | 6-8Ω | 53113 | 69AIZ6 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | Packard-Bell PART No. | NOTES |
|---|---|---|---|
| | Tuner | 16048A | VHF |
| | Switch | | Phono-TV (DPDT Slide Type) |
| M3 | Switch | | Manual-Auto (DP 3 Position) |
| M4 | Switch | | Off-On (Part of Motor M6) |
| M5 | Relay | | Pushbutton Tuning |
| | Motor | | Tuner Drive |
| M7 | Circuit Breaker | | |
| M8 | Relay | | Lo |
| M9 | Relay | | Hi |
| M10 | Relay | | Volume Lo |
| M11 | Relay | | Volume Hi |
| M12 | Motor | | Automatic Tuning |

## WIRING DATA

| | |
|---|---|
| High Voltage Lead | Use BELDEN No. 8869 |
| Shielded Hook-up Wire | Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor) |
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors |
| Power Cord (Interlock Type) | Use BELDEN No. 8874 |
| 300Ω Tuner Input Lead | Use BELDEN No. 8225 |
| 300Ω Antenna Lead-In | Use BELDEN No. 8230 or 8275 |
| Antenna Rotor Cable | Use BELDEN No. 8484 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor |



# REMOTE CONTROL RECEIVER PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No | USE | CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA TYPE |
|---|---|---|
| V20 | 40KC Amp. - Hi Volume Relay Control | 6AW8A |
| V21 | 40KC Amp. - Lo Volume Relay Control | 6AW8A |
| V22 | 40KC Amp. - Difference Freq. Amp. | 6BA8A |
| V23 | Difference Freq. Amp. | 6BA8A |
| V24 | Hi Channel Relay Control - Lo Channel Relay Control | 12AT7 |

## ELECTROLYTIC CAPACITORS

| ITEM No | RATING CAP | RATING VOLT | REPLACEMENT DATA Packard-Bell PART No | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No | PYRAMID PART No | SPRAGUE PART No | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C103A | 50 | 150 | 24180 | AYH3-11-20 | C0103 | FP311.6 | TMT-162 | TVL-3441 | |
| B | 40 | 150 | | | | | | | |
| C | 10 | 150 | | | | | | | |
| C104 | 5 | 50 | 24164 | PWE50006 | EC5-50 | TT503B | ML5-50 | TE-1303 | |
| C105 | 5 | 50 | | | | | | | |
| C106 | 5 | 50 | | | | | | | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No | MALLORY PART No | SPRAGUE PART No |
|---|---|---|---|---|---|---|---|---|
| C107 | 50000 | | BPD-05 | DD-503 | CUB2S5 | 1DP-2-503 | GP150 | 5HK-S50 |
| C108 | 50000 | | BPD-05 | DD-503 | CUB2S5 | 1DP-2-503 | GP150 | 5HK-S50 |
| C109 | .0015 200V 10% | | V84C4D15-10% | | PM6D15 | 6DP-1-152 | GP215 | 6TM-D15 |
| C110 | 1000 10% | | DI-1000 | DD-102 | PM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C111 | 470 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C112 | 50000 | | BPD-05 | DD-503 | CUB2S5 | 1DP-2-503 | GP150 | 5HK-S50 |
| C113 | .0015 200V 10% | | V84C4D15-10% | DD-152 | PM6D15 | 6DP-1-152 | GP215 | 6TM-D15 |
| C114 | 1000 10% | | DI-1000 | DD-102 | PM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C115 | 470 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C116 | 50000 | | BPD-05 | DD-503 | PM6S5 | 1DP-1-152 | GP150 | 5HK-S50 |
| C117 | 5000 | | BTA5D05 | DD-503 | PM6S5 | CCD-502 | GP350 | 5HK-D50 |
| C118 | 2000 10% | | DI-2000 | | PM6D2 | CCD-202 | GP230 | 10TS-D20 |
| C119 | .1 200V 10% | | V84C2P1-10% | | PM2P1 | 2DP-3-104 | GEM-301 | 2TM-P1 |
| C120 | 2000 10% | | DI-2000 | | PM6D2 | CCD-202 | GP230 | 10TS-D20 |
| C121 | .1 200V 10% | | V84C2P1-10% | | PM2P1 | 2DP-3-104 | GEM-301 | 2TM-P1 |
| C122 | 680 10% | | DI-680 | DD-681 | 1R5T68 | CCD-681 | GP368 | 10TS-T68 |
| C123 | .012 200V 5% | | | | | 6DP-2-123 | | 5BF-S12 |
| C124 | 50000 | | BPD-05 | DD-503 | CUB2S5 | 1DP-2-503 | GP150 | 5HK-S50 |
| C125 | .1 200V 10% | | V84C2P1-10% | | PM2P1 | 2DP-3-104 | GEM-301 | 2TM-P1 |
| C126 | 2200 10% | | DI-2200 | | PM6D22 | CCD-223 | GP222 | 10TS-D22 |
| C127 | .033 200V 5% | | V84C2S33-5% | | | 4DP-2-333-5% | | 5BF-S33 |
| C128 | 50000 | | BPD-05 | DD-503 | CUB2S5 | 1DP-2-503 | GP150 | 5HK-S50 |
| C129 | .1 200V 10% | | V84C2P1-10% | | PM2P1 | 2DP-3-104 | GEM-301 | 2TM-P1 |
| C130 | 330 10% | | DI-330 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C131 | .006 200V 5% | | | | | 6DP-1-602-5% | | |
| C132 | 50000 | | BPD-05 | DD-503 | CUB2S5 | 1DP-2-503 | GP150 | 5HK-S50 |
| C133 | 50000 | | BPD-05 | DD-503 | CUB2S5 | 1DP-2-503 | GP150 | 5HK-S50 |
| C134 | 220 10% | | DI-220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C135 | .0039 200V 5% | | | | 1R5D39 | 6DP-1-392-5% | MCM462.5 | 5BF-D39 |
| C136 | 50000 | | BPD-05 | DD-503 | CUB2S5 | 1DP-2-503 | GP150 | 5HK-S50 |
| C137 | 50000 | | BPD-05 | DD-503 | CUB2S5 | 1DP-2-503 | GP150 | 5HK-S50 |
| C138A | 10000 1400V | | DAC-27 | DD16-103 | HVE16S1 | 16DP-3-103 | UAC-110 | BL-S10 |
| B | 10000 1400V | | DAC-27 | DD16-103 | HVE16S1 | 16DP-3-103 | UAC-110 | BL-S10 |

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA Packard-Bell PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R115A | 1meg | 1/4 | 25995 | | | | | Lo Volume Drive |
| B | 1meg | 1/4 | | | | | | Hi Volume Drive |
| R116A | 1meg | 1/4 | 25995 | | | | | Lo Channel Drive |
| B | 1meg | 1/4 | | | | | | Hi Channel Drive |
| R117A | 10K | ½ | 25857 | AB-26 | B47-25K-S | B11-120 | TA253L | Bias |
| B | Shaft | | | AK-1 | Not Req. | TM4 | Not Req. | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R118 | 1000Ω | |
| R119 | 220Ω | |
| R120 | 470K | |
| R121 | 820Ω | |
| R122 | 470K | |
| R123 | 3900Ω | |
| R124 | 1000Ω | |
| R125 | 100K | |
| R126 | 68K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R127 | 100K | |
| R128 | 8200Ω | |
| R129 | 220K | |
| R130 | 100K | |
| R131 | 22K | |
| R132 | 100K | |
| R133 | 8200Ω | (12K) * |
| R134 | 1meg | |
| R135 | 1meg | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R136 | 470K | |
| R137 | 470K | |
| R138 | 1meg | |
| R139 | 27K | |
| R140 | 10K | (3300Ω)* |
| R141 | 10K | |
| R142 | 1000Ω | |

* Alternate value.

# REMOTE CONTROL RECEIVER
# PARTS LIST AND DESCRIPTIONS (Continued)

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | Packard-Bell PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K1 | Difference Freq. Detector Network | 470mmf, 2000mmf, 2000mmf, 2000mmf, 10000mmf, 47K, 100K, 470K, 470K, 470K, 470K | 23664 | |

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | Packard-Bell PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L22 | 41.5KC Input Coil | | | | | | | |
| L23 | 41.5KC Coil | | | | | | | |
| L24 | 38KC Coil | | | | | | | |
| L25 | 2KC Coil | | | | | | | |
| L26 | 3.5KC Coil | | | | | | | |
| L27 | 2.7KC Coil | | | | | | | |
| L28 | 1.25KC Coil | | | | | | | |

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | Packard-Bell PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T7 | 117V @ .21A | 120V @ .020A tap @ 6.3V @ 2.8A | | 89079 | | | | | | |

## RECTIFIERS

| ITEM No. | RATING | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CURRENT (Measured) | Packard-Bell PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | |
| M13 | .020A | ♦ | | | | | * Selenium Diode<br>♦ Selenium Type |
| M14 | Signal | 72027 * | | | | | |
| M15 | Signal | 72027 * | | | | | |
| M16 | Signal | 72027 * | | | | | |
| M17 | Signal | 72027 * | | | | | |
| M18 | Signal | ♦ | | | | | |
| M19 | Signal | ♦ | | | | | |
| M20 | Signal | ♦ | | | | | |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|
| | | Packard-Bell PART No. | CBS PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| M21 | 1N64 | | 1N64 | 1N60 | 1N64 | Remote Receiver, Difference Freq. Amp. Grid |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire ..... | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |

# REMOTE CONTROL TRANSMITTER
# PARTS LIST AND DESCRIPTIONS

## TRANSISTORS

| ITEM No. | ORIG. TYPE | USE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | CBS PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| X1 | 2N363 | Oscillator | | 2N406 | 2N363 | 2N406 | PNP |
| X2 | 2N363 | Oscillator | | 2N406 | 2N363 | 2N406 | PNP |
| X3 | 2N362 | Output | | 2N406 | 2N362 | 2N406 | PNP |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | Packard-Bell PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C139 | 5 | 50 | 24164 | PWE50005 | EC5-50 | TT50X5 | ML5-50 | TE-1303 | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C140 | 1000 10% | | DI-1000 | DD-102 | STM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C141 | 330 10% | | DI-330 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C142 | | | | | | | | |
| C143 | .015 200V 5% | | V84C2S15-5% | | | 4DP-1-153 | | 5BF-S15 |
| C144 | 50000 | | BPD-05 | DD-503 | | 1DP-2-503 | GP150 | 5HK-S50 |
| C145 | 1000 10% | | DI-1000 | DD-102 | STM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C146 | 50000 | | BPD-05 | DD-503 | | 1DP-2-503 | GP150 | 5HK-S50 |
| C147 | 330 10% | Note 1 | DI-330 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C148 | 2300 10% | | DI-2200 | | | CCD-222 | GP222 | 10TS-D22 |
| C149 | | | | | | | | |
| C150 | | | | | | | | |
| C151 | 470 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C152 | .015 200V 5% | | V84C2S15-5% | | | 4DP-1-153 | | 5BF-S15 |
| C153 | 50000 | | BPD-05 | DD-503 | | 1DP-2-503 | GP150 | 5HK-S50 |

Note 1. Not used in some versions.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R143 | 120K | |
| R144 | 120K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R145 | 47Ω | |
| R146 | 470Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R147 | 100K | |

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | Packard-Bell PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L29 | 41KC Trans. | | | | | | | |
| L30 | 41.5KC Trans. | | | | | | | |
| L31 | 41.5KC Output Coil | | | | | | | |

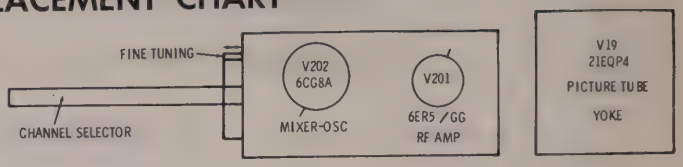
## BATTERIES

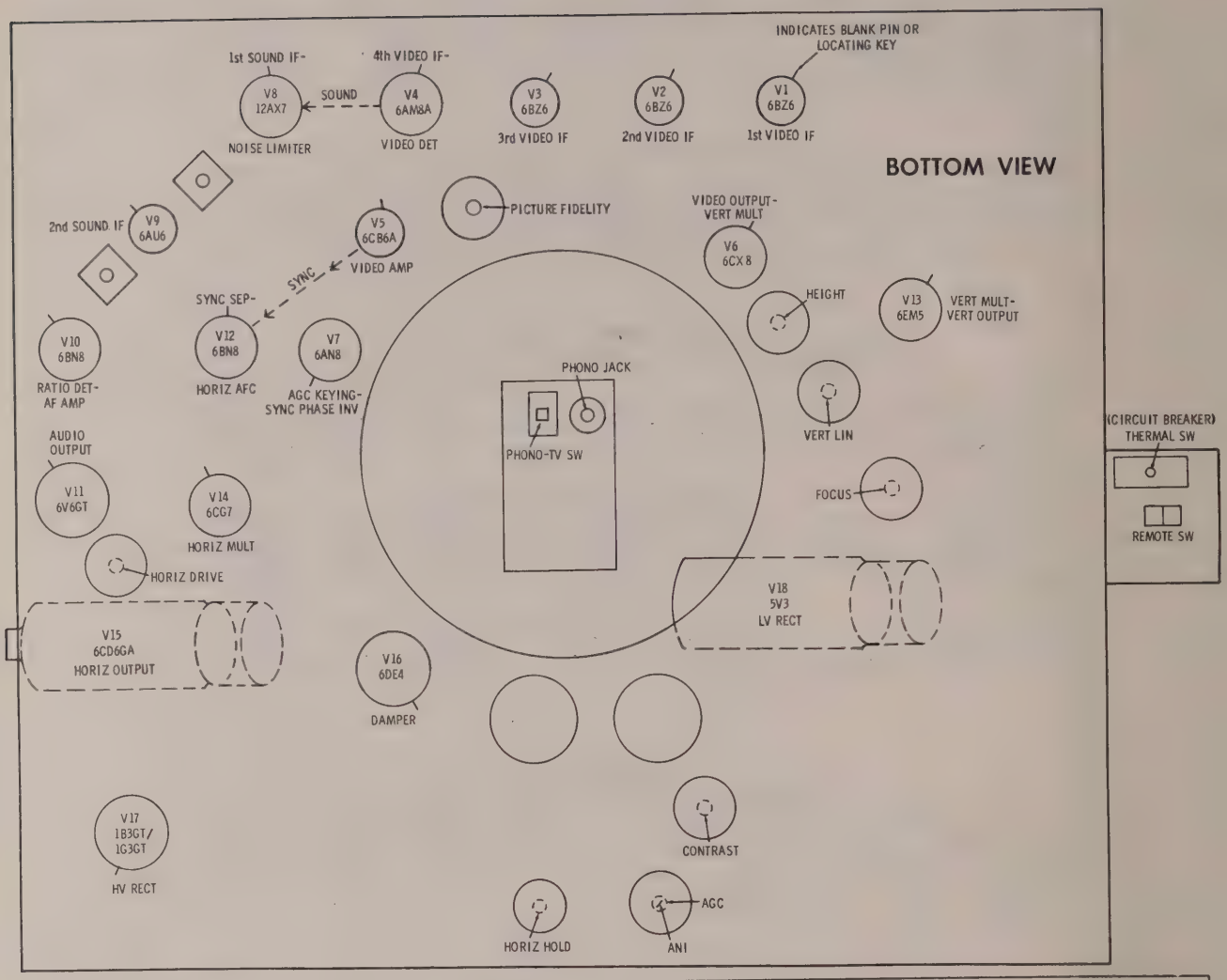
| ITEM No. | VOLTAGE | Packard-Bell PART No. | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | BURGESS | | EVEREADY | | MALLORY | | |
| | | | "A" | "B" | "A" | "B" | "A" | "B" | |
| M22 | 22.5V | | | U15 | | 412 | | M215 | 1 Required |

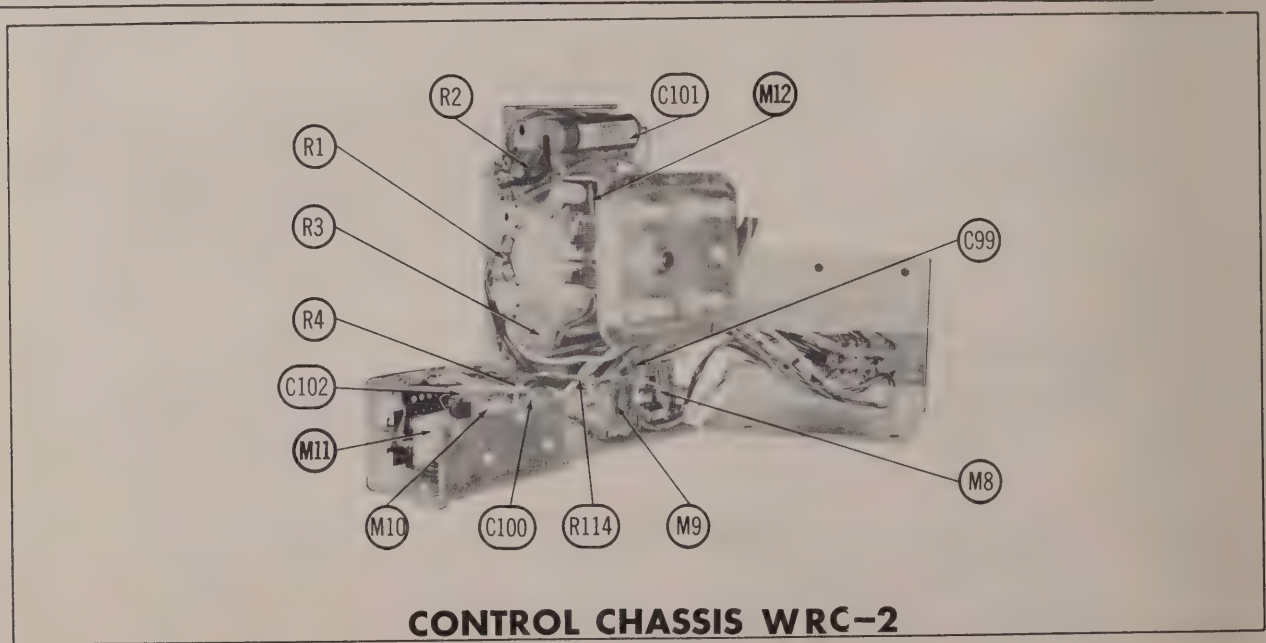
## MISCELLANEOUS

| ITEM No. | PART NAME | Packard-Bell PART No. | NOTES |
|---|---|---|---|
| M23 | Switch | | Volume Lo, Off (Pushbutton Type) |
| M24 | Switch | | Channel Hi, Channel Lo (Pushbutton Type) |

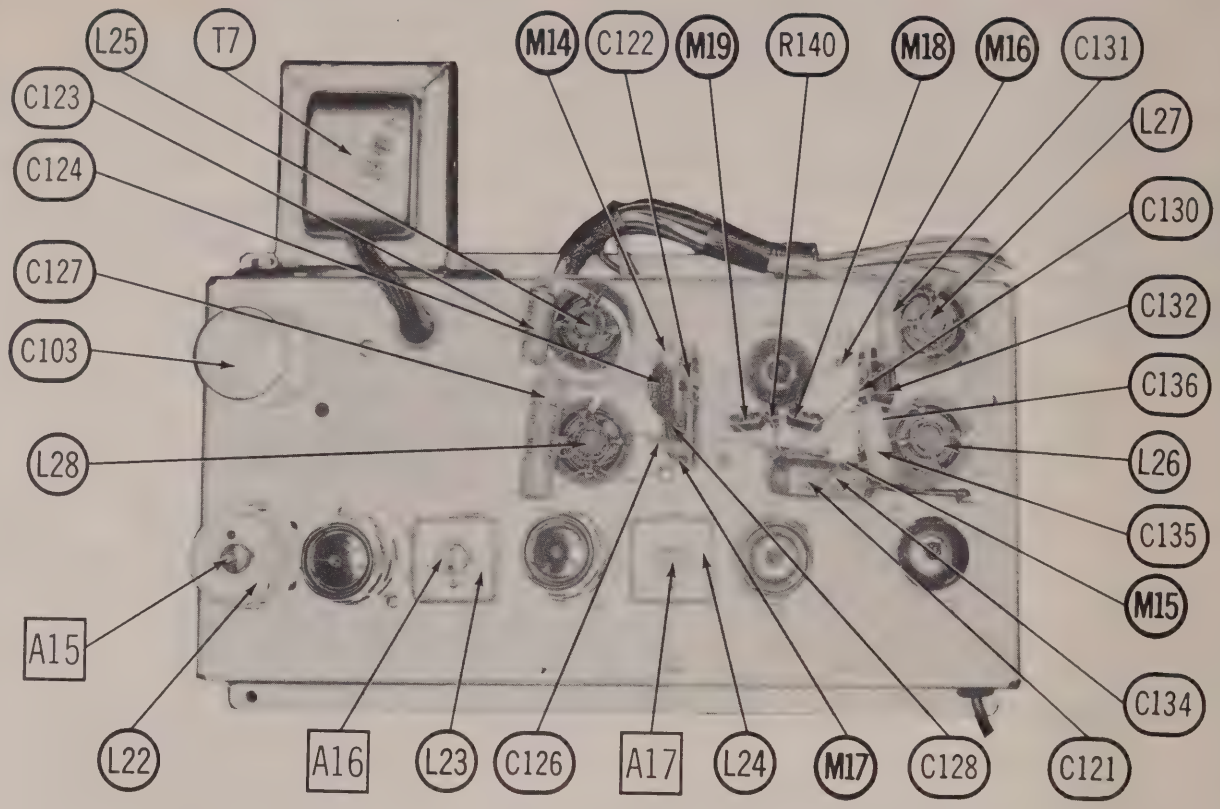
# TV TUBE PLACEMENT CHART



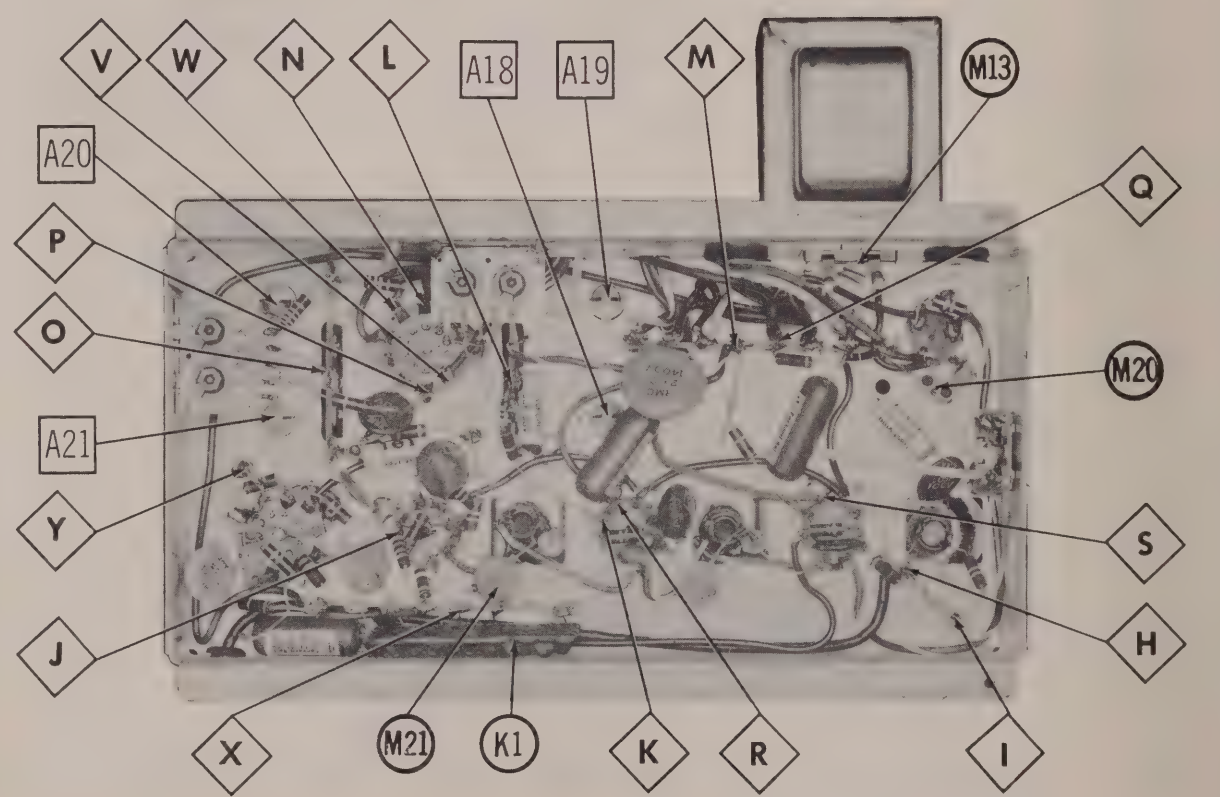



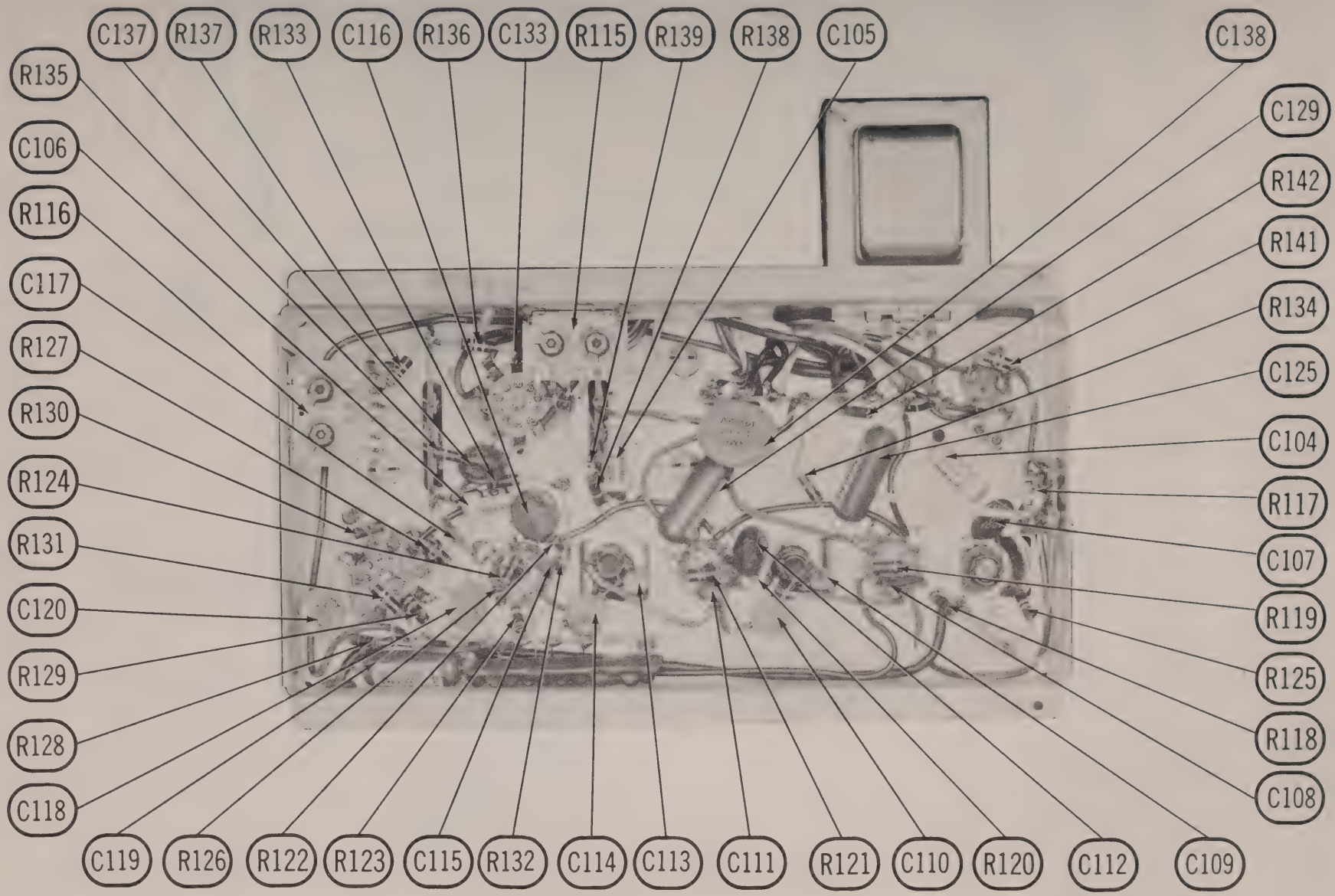

## CONTROL CHASSIS WRC-2




REMOTE CONTROL RECEIVER WRR-2 - TOP VIEW




REMOTE CONTROL RECEIVER WRR-2 BOTTOM VIEW-ALIGN & MISC IDENT




REMOTE CONTROL RECEIVER WRR-2 BOTTOM VIEW - CAPACITOR & RESISTOR IDENT.

# TUNER ALIGNMENT INSTRUCTIONS

## 10648 A

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A203 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A216 thru A227 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect the negative lead of a 4.5 volts bias supply to point ⓣ. Positive to chassis.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | | Across antenna terminals with 120Ω in each lead. | 195MC | 193.25MC<br>197.75MC | 10 | Vert. Amp. thru 10K to point ⓤ. Low side to chassis. | A201<br>A202<br>A203 | Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope. |
| 2. | | " | 213MC | 211.25MC<br>215.75MC | 13 | " | A204 | Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns. |
| | | | 207MC | 205.25MC<br>209.75MC | 12 | | A205 | |
| | | | 201MC | 199.25MC<br>203.75MC | 11 | | A206 | |
| | | | 195MC | 193.25MC<br>197.75MC | 10 | | A207 | |
| | | | 189MC | 187.25MC<br>191.75MC | 9 | | A208 | |
| | | | 183MC | 181.25MC<br>185.75MC | 8 | | A209 | |
| | | | 177MC | 175.25MC<br>179.75MC | 7 | | A210 | |
| | | | 85MC | 83.25MC<br>87.75MC | 6 | | A211 | |
| | | | 79MC | 77.25MC<br>81.75MC | 5 | | A212 | |
| | | | 69MC | 67.25MC<br>71.75MC | 4 | | A213 | |
| | | | 63MC | 61.25MC<br>65.75MC | 3 | | A214 | |
| | | | 57MC | 55.25MC<br>59.75MC | 2 | | A215 | |

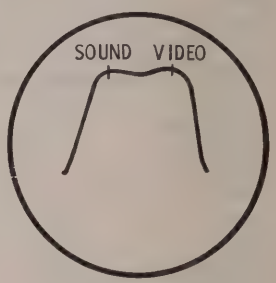



FIG. 201

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Use 10MC sweep unless otherwise noted.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 3. | | Across antenna terminals with 120Ω in each lead. | 213MC | 211.25MC<br>215.75MC | 13 | Vert. Amp. thru 47K across Video Det. -load. | A216 | Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%. |
| | | | 207MC | 205.25MC<br>209.75MC | 12 | | A217 | |
| | | | 201MC | 199.25MC<br>203.75MC | 11 | | A218 | |
| | | | 195MC | 193.25MC<br>197.75MC | 10 | | A219 | |
| | | | 189MC | 187.25MC<br>191.75MC | 9 | | A220 | |
| | | | 183MC | 181.25MC<br>185.75MC | 8 | | A221 | |
| | | | 177MC | 175.25MC<br>179.75MC | 7 | | A222 | |
| | | | 85MC | 83.25MC<br>87.75MC | 6 | | A223 | |
| | | | 79MC | 77.25MC<br>81.75MC | 5 | | A224 | |
| | | | 69MC | 67.25MC<br>71.75MC | 4 | | A225 | |
| | | | 63MC | 61.25MC<br>65.75MC | 3 | | A226 | |
| | | | 57MC | 55.25MC<br>59.75MC | 2 | | A227 | |

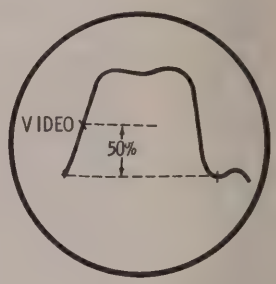
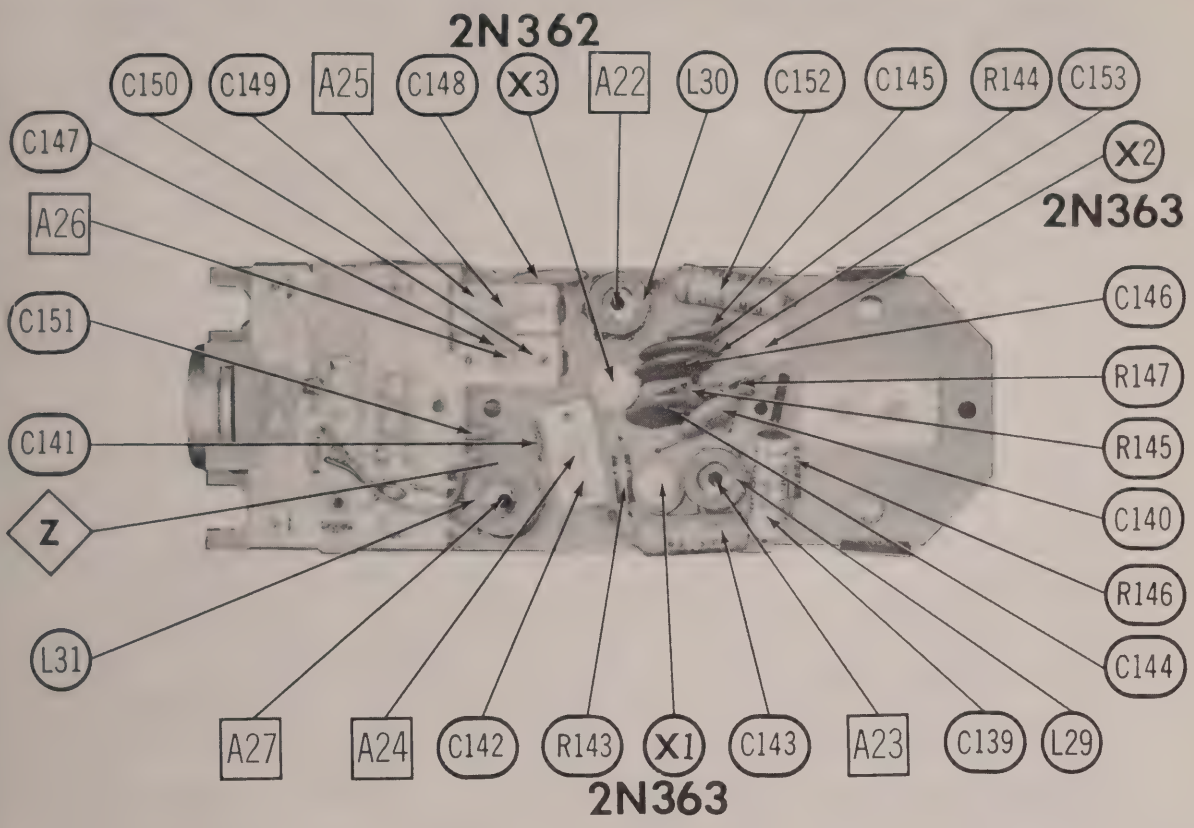
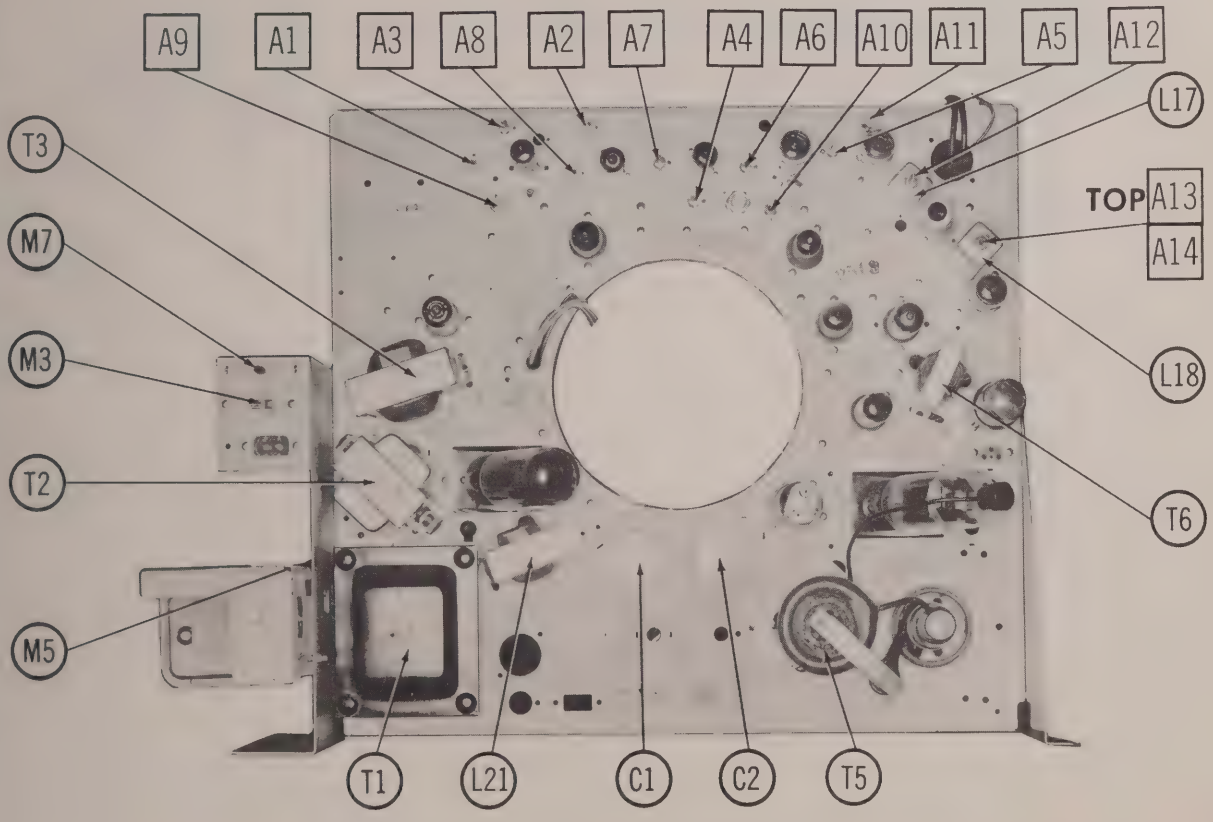



FIG. 202




REMOTE CONTROL TRANSMITTER WRT-2 - TOP VIEW



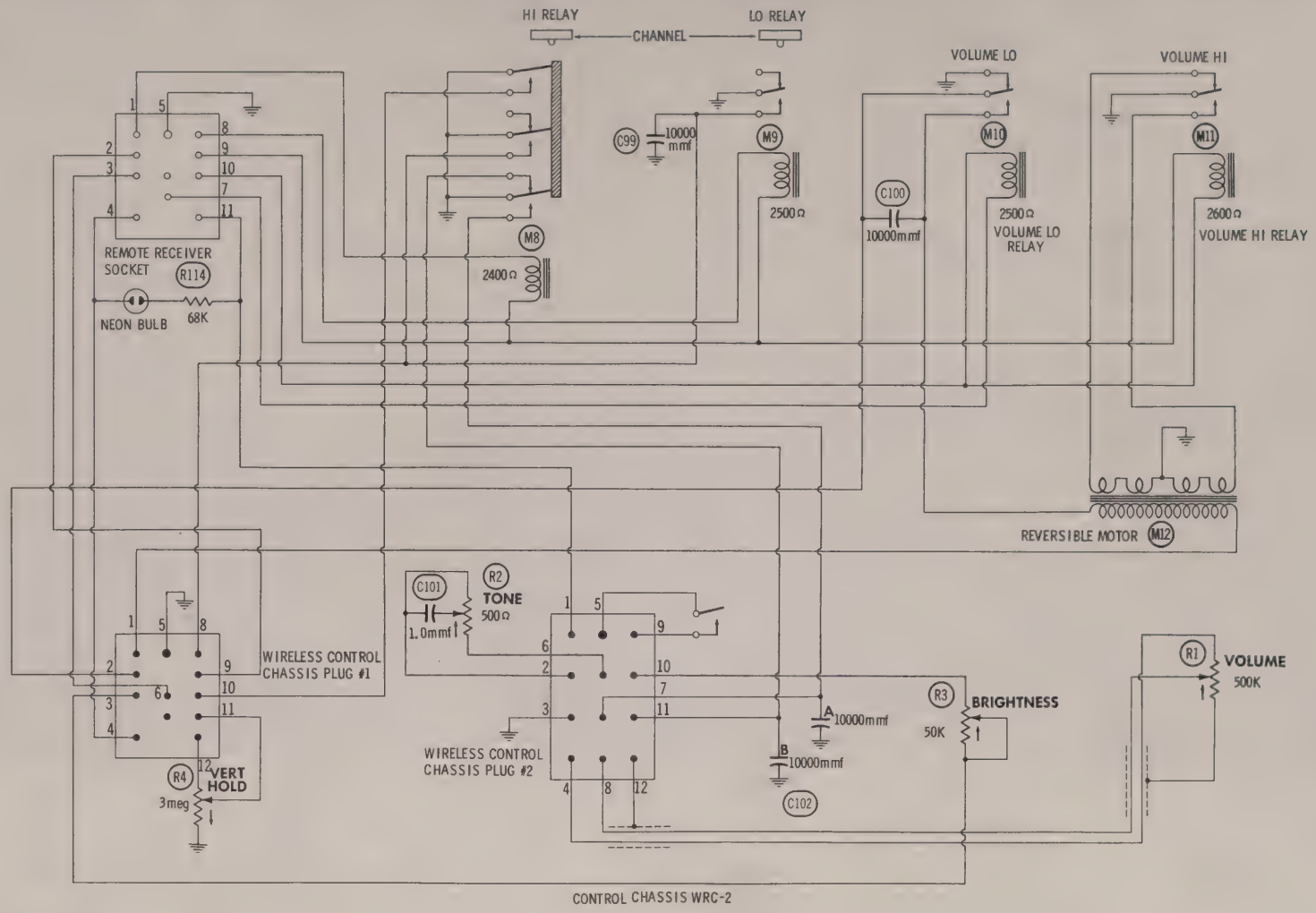

TV CHASSIS - TOP VIEW

# RESISTANCE MEASUREMENTS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BZ6 | • 55K | 56Ω | 0Ω | .1Ω | ▲ 470Ω | ▲ 470Ω | 0Ω | | |
| V2 | 6BZ6 | 60K | ▲ 100Ω | 0Ω | .1Ω | †500Ω | †500Ω | INF | | |
| V3 | 6BZ6 | • 55K | 56Ω | 0Ω | .1Ω | †3000Ω | †3000Ω | 0Ω | | |
| V4 | 6AM8A | 180Ω | .1Ω | †4000Ω | 0Ω | .1Ω | †4000Ω | .2Ω | 2800Ω | 0Ω |
| V5 | 6CB6A | 2800Ω | 68Ω | .1Ω | 0Ω | †5700Ω | †3000Ω | 0Ω | | |
| V6 | 6CX8 | 0Ω | 4.5meg | • †3.3meg | 0Ω | .1Ω | •150Ω | 220K | †3000Ω | †3900Ω |
| V7 | 6AN8 | †13K | †1meg | 3300Ω | .1Ω | 0Ω | • 300K | †38Ω | †53K | †3000Ω |
| V8 | 12AX7 | †105K | •180K | 2200Ω | .1Ω | .1Ω | †4000Ω | 100K | 68Ω | 0Ω |
| V9 | 6AU6 | 100K | 0Ω | 0Ω | .1Ω | †6300Ω | †21K | 120Ω | | |
| V10 | 6BN8 | INF | 0Ω | INF | .1Ω | 0Ω | 24K | †440K | 4.7meg | 18Ω |
| V11 | 6V6GT | TP | .1Ω | †480Ω | †38Ω | 470K | TP | 0Ω | 560Ω | |
| V12 | 6BN8 | 2meg | 1meg | 1meg | .1Ω | 0Ω | 560Ω | †75K | 4.7meg | 0Ω |
| V13 | 6EM5 | †470Ω | NC | • 3.2meg | 0Ω | .1Ω | •3.2meg | 0Ω | NC | †745Ω |
| V14 | 6CG7 | †6800Ω | 2.5meg | 1200Ω | .1Ω | 0Ω | †150K | 100K | 1200Ω | |
| V15 | 6CD6GA | TP | 0Ω | 0Ω | NC | •750K | NC | .1Ω | †12K | TOP CAP †16.4Ω |
| V16 | 6DE4 | NC | TP | ¶2meg | NC | †38Ω | NC | .1Ω | 0Ω | |
| V17 | 1B3GT/ 1G3GT | PINS 1 THRU 8 HAVE INFINITE RESISTANCE | | | | | | | | TOP CAP †460Ω |
| V18 | 5V3 | NC | ¶ | NC | 22Ω | NC | 25Ω | NC | ¶ | |
| V19 | 21EQP4 | 0Ω | 220K | †1.2meg | • †600K | NC | NC | • 200K | .1Ω | |
| V201 | 6ER5/ GG | 0Ω | 2.8meg | 0Ω | .1Ω | †4700Ω | 0Ω | 0Ω | | |
| V202 | 6CG8A | 4700Ω | †20K | 0Ω | 0Ω | .1Ω | †4500Ω | †15K | 0Ω | 220K |
| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 260V SOURCE.
▲ MEASURED FROM PIN 7 OF V2.
‡ MEASURED FROM PIN 3 OF V16.

NC NO CONNECTION
TP TIE POINT




A PHOTOFACT STANDARD NOTATION SCHEMATIC

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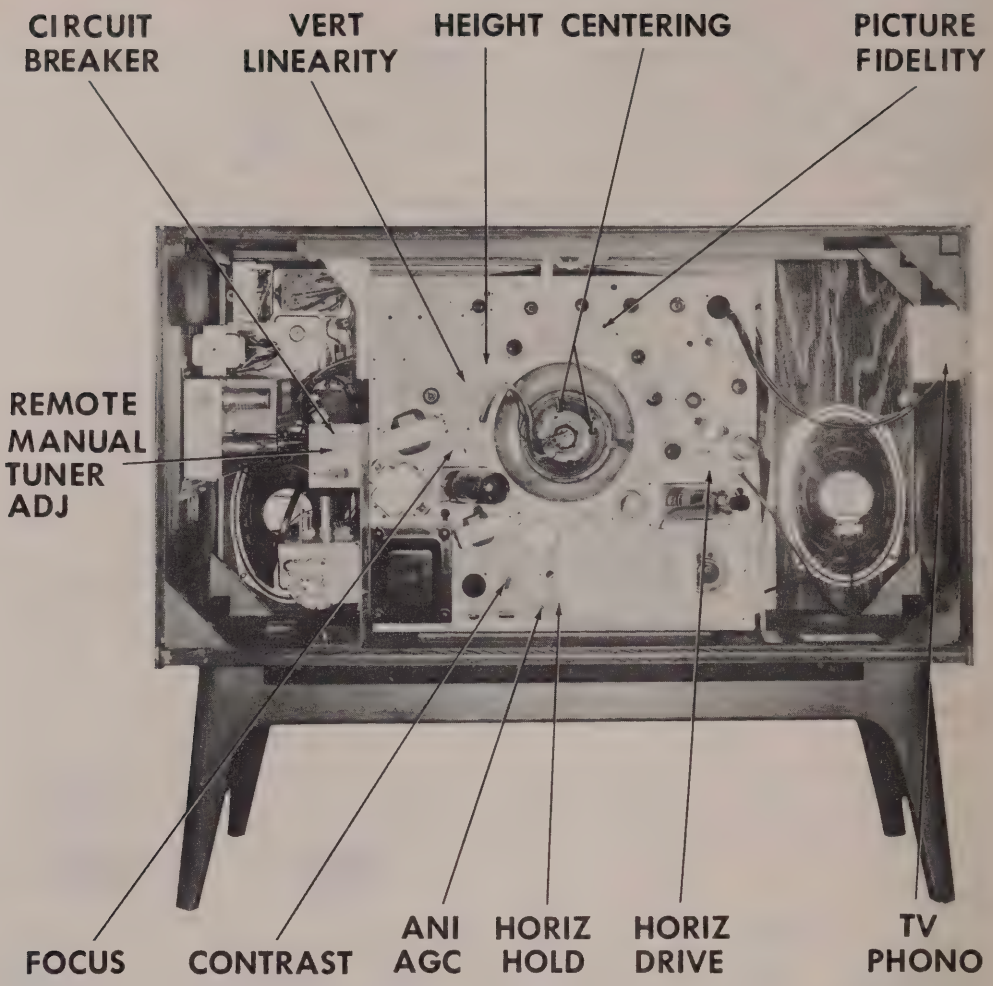
# CONTROL CHASSIS WRC-2

## PACKARD-BELL MODEL 21DC16 (Ch.98D6)




## CABINET—REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

Turn Horizontal Drive counterclockwise until Drive lines appear near center of screen and then clockwise until Drive lines just disappear.

## DISASSEMBLY INSTRUCTIONS

NOTE: All main chassis components can be serviced while chassis is in cabinet by using the following procedure.

1. Remove rear cover. (See Step 1 in "Chassis Removal".)
2. Loosen 1 metal screw under tuner. Slide tuner back as far as possible.
3. Remove 1 chassis screw at right bottom of chassis.
4. Remove 1 wood screw holding stereo input bracket.
5. Remove HV lead and speaker plug.
6. Chassis will now swing out for access to parts.

CHASSIS REMOVAL

1. Remove 3 push-on type knobs from rear of cabinet. Remove 7 wood screws and 1 metal screw holding the rear cover. Remove antenna tuner leads. Remove the rear cover.
2. Remove Remote Control chassis plug, front panel control plug, speaker plug, HV lead and picture tube socket.
3. Loosen yoke clamp.
4. Remove 1 wood screw holding stereo input bracket.
5. Remove 1 chassis mounting bolt at right bottom of chassis.
6. Loosen 2 metal screws on upper left side of chassis holding chassis mounting bracket. Slide bracket down.
7. Remove 2 screws holding channel indicator on lamp panel.
8. Remove chassis.
9. Remove 2 metal screws holding Remote Control chassis to mounting track. Remove mic plug and Remote Control chassis plug.
10. Remove Remote Control chassis.
11. Remove 4 push-on type knobs from front of cabinet.
12. Remove 2 nuts and 1 metal screw holding front control bracket. Remove bracket.

PHOTOFACT® Folder with CIRCUITRACE®

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

# PHILCO CHASSIS 10L60, 10L60R, 10L60UR

PHILCO CHASSIS
10L60, 10L60R, 10L60UR

PHILCO CHASSIS
10L60, 10L60R, 10L60UR

MODEL H4686S(CH. 10L60)

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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PHOTOFACT® Folder with CIRCUITRACE®

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

# PHILCO CHASSIS 10L60, 10L60R, 10L60UR

PHILCO CHASSIS 10L60, 10L60R, 10L60UR

## DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 wood screws holding rear cover. Remove rear cover.
2. Remove 4 push-on type knobs from the top of the cabinet.
3. Remove metal screw under Contrast control knob now visible. Remove Volume-Contrast control and the pilot lamp assembly.
4. Remove 2 wood screws holding rear control panel.
5. Remove speaker leads, tuner leads, antenna leads, HV leads, picture tube socket and yoke plug.
6. Remove 6 chassis and tuner bolts.
7. Remove chassis.
8. Remove 1 tuner brace screw at left rear of cabinet. Remove Tuner Assembly.

MODEL H4686S(CH. 10L60)

PHILCO CHASSIS 10L60, 10L60R, 10L60UR

| TRADE NAME | Philco | MODELS | CHASSIS |
|---|---|---|---|
| | | H4686S, SL | 10L60 |
| | | H4686SLR, SR, H6636SLR, SR, SWR (With Remote Control RC50) | 10L60R |
| | | UH4686S, SL | 10L60U |
| | | UH4686SR, SLR, UH6636SLR, SR, SWR (With Remote Control RC50) | 10L60UR |
| MANUFACTURER | Philco Corp., Tioga & "C" Streets, Philadelphia, Pa. | | |
| TYPE SET | TV Receiver | | |
| TUBES | VHF-Eighteen, UHF-Nineteen, Remote Control with Preamp. - Seven, One Transistor | | |
| POWER SUPPLY | 105-120 Volts AC, 60 Cycle RATING 205 Watts, 1.9 Amp. @ 117 Volts AC (Less Remote Control) | | |
| TUNING RANGE | Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) | | |

## SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 4 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE

A fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)
A fuse wire is used for filament protection. (For location, see M3 in photo "Chassis Bottom View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the chassis. (See "Disassembly Instructions".)

AGC

The AGC may be varied by means of a Range switch. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Cabinet Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency control (R7A). (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Width control. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnets, located behind the yoke, on the neck of the picture tube.

PINCUSHION CORRECTION

One magnet is used for pincushion correction.

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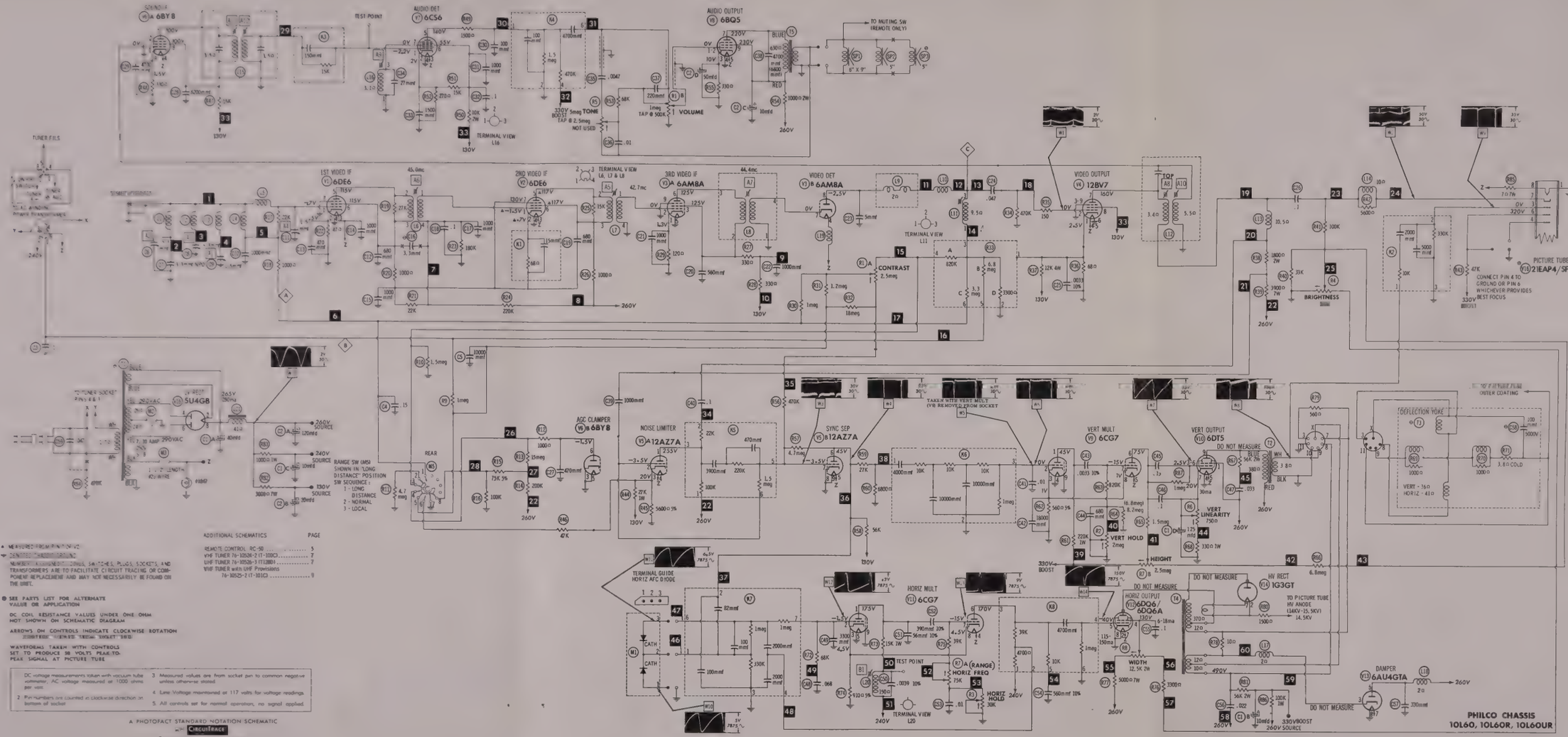
JA738



SET 476 FOLDER 2


PHILCO CHASSIS
10L60, 10L60R, 10L60UR
SOUND
AUDIO DET
AUDIO OUTPUT
1ST VIDEO IF
2ND VIDEO IF
3RD VIDEO IF
VIDEO DET
VIDEO OUTPUT
NOISE LIMITER
AGC CLAMPER
SYNC SEP
VERT MULT
VERT OUTPUT
HORIZ MULT
HORIZ OUTPUT
HV RECT
DAMPER
PICTURE TUBE
DEFLECTION YOKE
TUNER SOCKET
TEST POINT
TERMINAL VIEW
TERMINAL GUIDE
CONTRAST
VOLUME
TONE
BRIGHTNESS
HEIGHT
WIDTH
VERT HOLD
HORIZ HOLD
HORIZ FREQ
VERT LINEARITY
REAR
RANGE SW (MS)
SHOWN IN "LONG DISTANCE" POSITION
SW SEQUENCE:
1 - LONG DISTANCE
2 - NORMAL
3 - LOCAL
TO MUTING SW (REMOTE ONLY)
TO PICTURE TUBE HV ANODE (14KV - 15.5KV) 14.5KV
330V BOOST
260V SOURCE
240V SOURCE
130V SOURCE
DO NOT MEASURE
TAKEN WITH VERT MULT (V9) REMOVED FROM SOCKET
CONNECT PIN 4 TO GROUND OR PIN 6 WHICHEVER PROVIDES BEST FOCUS
ADDITIONAL SCHEMATICS
REMOTE CONTROL RC-50 ..... 5
VHF TUNER 76-10526-2 (T-103C) ..... 7
UHF TUNER 76-10526-3 (T1203) ..... 7
VHF TUNER with UHF Provisions 76-10525-2 (T-101C) ..... 9
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt.
Pin numbers are counted in clockwise direction on bottom of socket
Measured values are from socket pin to common negative unless otherwise stated.
Line Voltage maintained at 117 volts for voltage readings.
All controls set for normal operation, no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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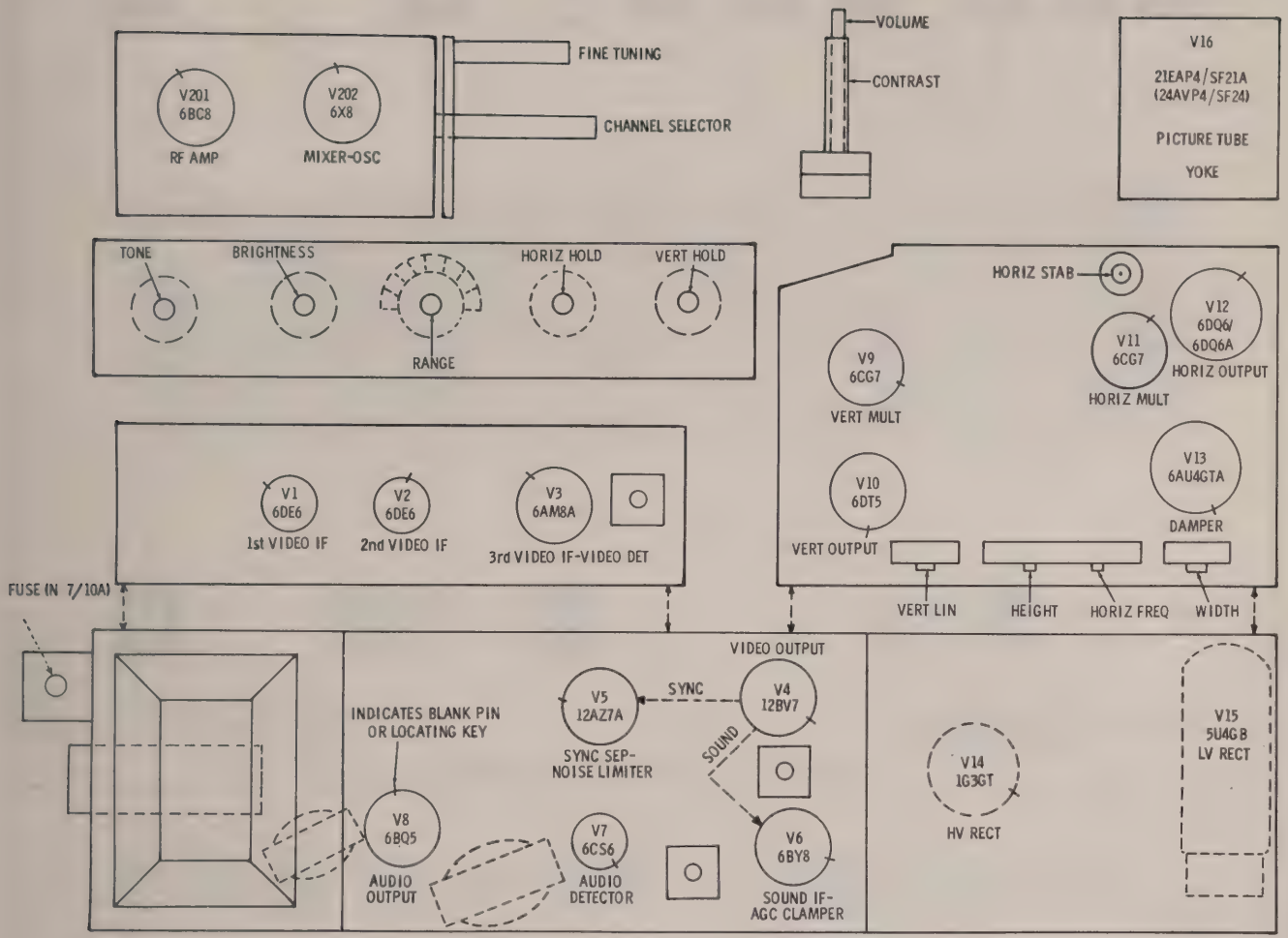
# TUBE PLACEMENT CHART




PHILCO CHASSIS
10L60, 10L60R, 10L60UR

# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound — Fuse (LV Power 7/10A), Fuse Wire (F11), V15

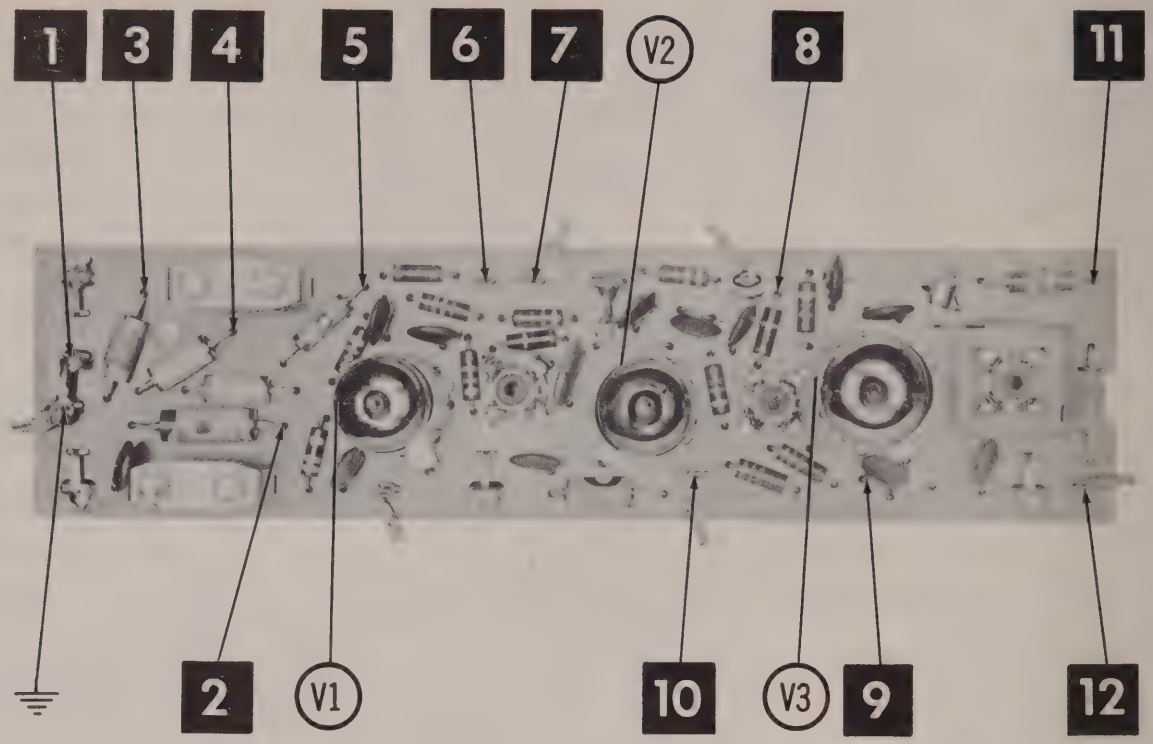
SWEEP FAILURE
No raster, has sound — V11, V12, V13, V14, V16
No vertical deflection — V9, V10
Poor vert. linearity or foldover — V9, V10
Poor horiz. linearity or foldover — V11, V12, V13
Narrow picture — V11, V12, V13, V15
Vert. off freq. — V9
Horiz. off freq. — Diode (Horiz. AFC), V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster — V1, V2, V3, V4
No pic, no sound, has snow — V201, V202, V1
No pic, has sound, has raster — V4, V16
Has pic, no sound — V6, V7, V8

SYNC FAILURE
No vert. sync — V5
No horiz. sync — V5
No vert. or horiz. sync — V5

FOLDER 2

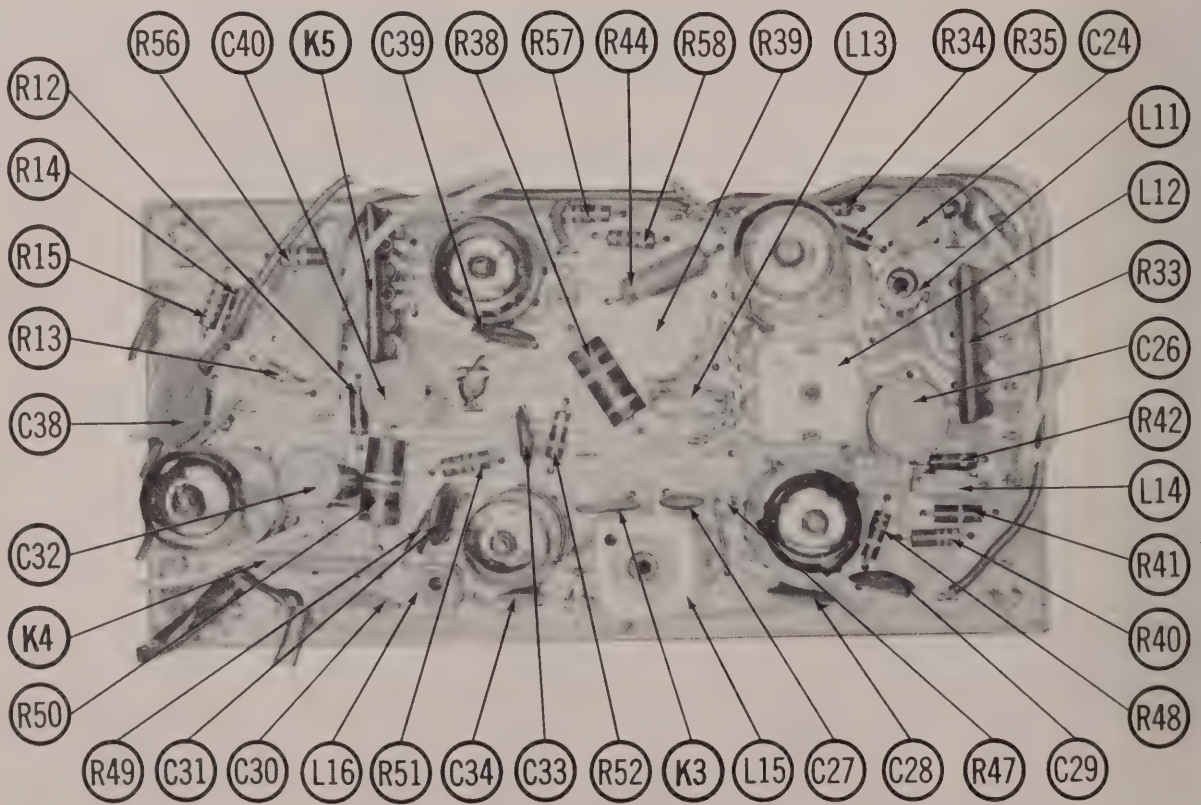
CircuiTrace Numbers 1 thru 12



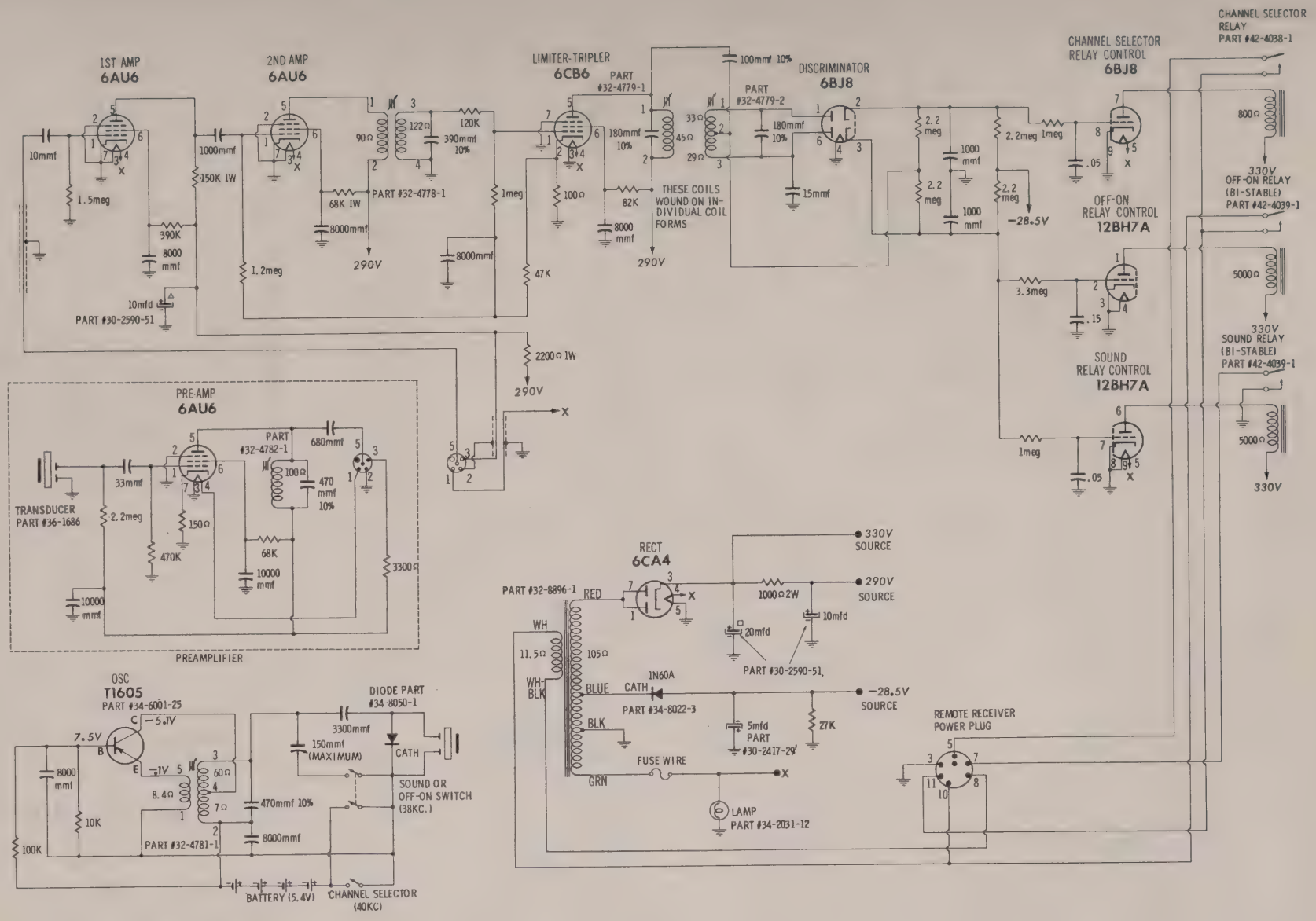

A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VIDEO IF PRINTED BOARD




VIDEO, SOUND PRINTED BOARD




A PHOTOFACT STANDARD NOTATION SCHEMATIC
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# REMOTE CONTROL RC-50

## PHILCO CHASSIS 10L60, 10L60R, 10L60UR

# ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Set Range switch to "Normal".
Suggested Alignment Tools: A1 thru A4 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A5 thru A12, & Mixer Plate Coil .. GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 6 volt bias supply to point (A). Positive to chassis.
Connect the negative lead of a 2.5 volt bias supply to point (B). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

| | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis. | Not used | 45.85MC (400∿ 30% AM Mod) | Any non-interfering channel | Vert. Amp. thru 10K to point (C). Low side to chassis. | Mixer Plate Coil | Adjust for maximum 400∿ indication on scope. |
| 2. | " | " | 41.25MC | " | " | A1 | Adjust for MINIMUM scope indication. |
| 3. | " | " | 47.40MC | " | " | A2, A3 | Adjust for MINIMUM scope indication. Repeat steps 2 and 3. |
| 4. | " | " | 42.7MC | " | " | A4, A5 | Adjust for maximum scope indication. |
| 5. | " | " | 45.0MC | " | " | A6 | " |
| 6. | " | " | 44.4MC | " | " | A7 | " |
| 7. | Across antenna terminals with 120Ω in each lead. | | 65.75MC | " | " | Fine Tuning | Adjust Fine Tuning for MINIMUM 400∿ scope indication. |
| 8. | " | 69MC (10MC Swp) | 67.25MC 70.5MC | 4 | " | | Check for response similar to Fig. 1. If necessary, retouch Mixer Plate Coil to place 67.25MC marker at 50%. Position 70.5MC marker at 50% by retouching A5 and level top of curve with A7. DO NOT retouch A4 and A6. |

4.5MC TRAP ALIGNMENT

Use a 4.5MC tuned detector similar to Fig. 2. Before aligning trap, connect detector to an accurate source of 4.5MC signal and adjust the coil slug for maximum DC voltage output.
Set Contrast control fully clockwise.

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 9. | High side thru .001mfd to point (C). Low side to chassis. | 4.5MC (400∿ 30% AM) | Any non-interfering channel | DC probe thru detector (Fig. 2) to pin 7 (cathode) of picture tube. Common to chassis. | A8 | Adjust for MINIMUM deflection on VTVM. |

SOUND IF ALIGNMENT

Tune in a strong signal and adjust A9 for maximum sound output. Connect the DC probe of VTVM thru 10K to TP-1. Disconnect antenna and adjust A10, A11 and A12 for maximum deflection. If necessary, retouch SLIGHTLY A10, A11 or A12 for MINIMUM noise in sound.

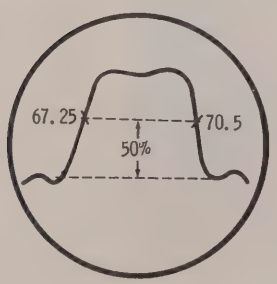


FIG. 1

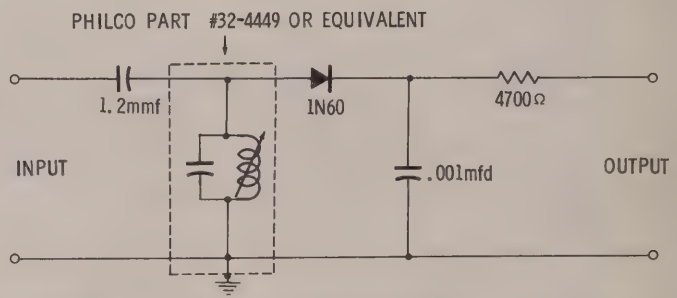
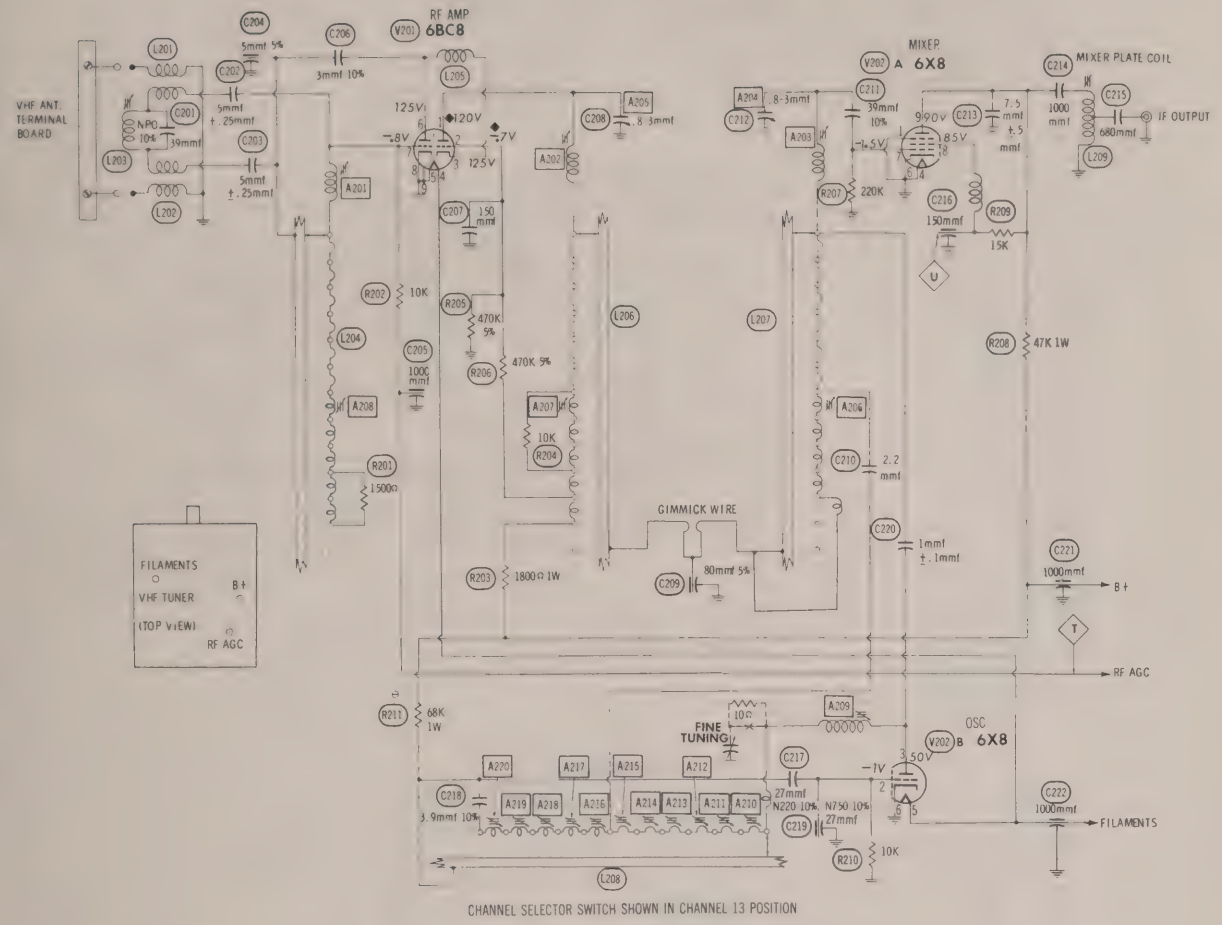


FIG. 2

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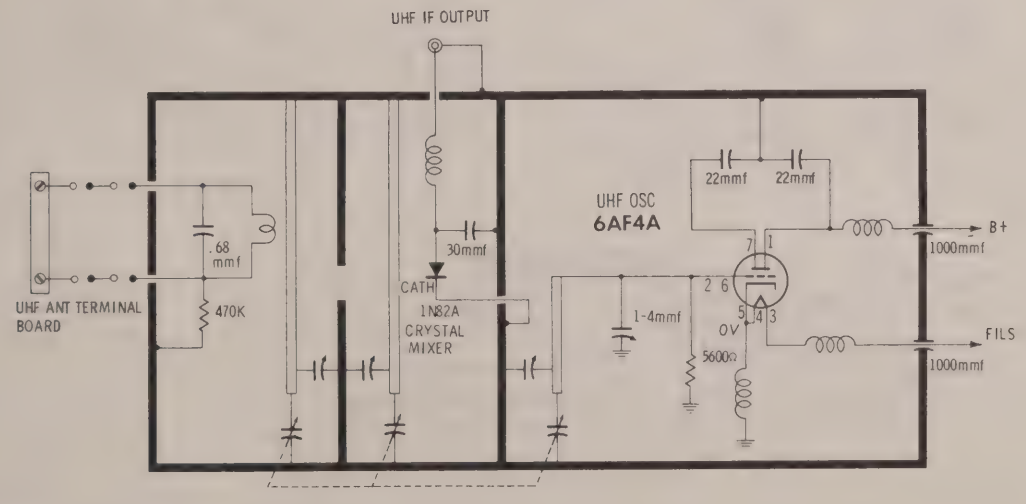
## VHF TUNER 76-10524-2 (T-100C)

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## UHF TUNER 76-10526-3 (T-28D)

# TUNER PARTS LIST AND DESCRIPTIONS

## 76-10524-2(T-100C)

### TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

| ITEM No. | USE | TYPE |
|---|---|---|
| V201 | RF Amplifier | 6BC8 |
| V202 | Mixer-Osc. | 6X8 |

### FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C201 | 39 NPO 10% | | NPO-DI 39 | TCZ-39 | C10Q39C | CCTO-390 | CNO-439 | 10TCC-Q39 |
| C202 | 5 ±.25mmf | | NPO-SI 5 | TCZ-4R7 | C10V5C | CCTO-050 | CNO-547 | 10TCC-V50 |
| C203 | 5 ±.25mmf | | NPO-SI 5 | TCZ-4R7 | C10V5C | CCTO-050 | CNO-547 | 10TCC-V50 |
| C204 | 5 10% | #30-1268-1 | | | | | | |
| C205 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C206 | 3 10% | | NPO-SI 3 | TCZ-3R3 | C10V3C | CCTO-3R3 | CNO-533 | 10TCC-V33 |
| C207 | 150 | | DI-150 | DD-151 | L10T15 | CCD-151 | GP315 | 10TS-T15 |
| C208 | .8-3 | | | 829-3 | | CV-1 | CT565 | |
| C209 | 80 5% | #30-1268-13 | | | | | | |
| C210 | 2.2 | | NPO-SI 2.2 | TCZ-2R2 | C10V22C | CCTO-2R2 | CNO-522 | 10TCC-V22 |
| C211 | 39 10% | | NPO-DI 39 | TCZ-39 | C10Q39C | CCTO-390 | CNO-439 | 10TCC-Q39 |
| C212 | .8-3 | | | 829-3 | | CV-1 | CT565 | |
| C213 | 7.5 ±.5mmf | | | | C10V8C | | GP580 | |
| C214 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C215 | 680 | | SI 680 | DD-681 | BYA10T68 | CCD-681 | GP368 | 10TS-T68 |
| C216 | 150 | #30-1268-6 | | | | | | |
| C217 | 27 N220 10% | #30-1271-3 | | | | * | | 10TCR-Q27 |
| C218 | 3.9 10% | | | | C10V4C | | | 10TCC-V39 |
| C219 | 27 N750 10% | #30-1268-4 | | | | CCTN-270 | | |
| C220 | 1 ±.1mmf | | NPO-SI 1 | TCZ-1 | | | CNO-510 | 10TCC-V10 |
| C221 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C222 | 1000 | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
# Philco Part Number.

### RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R201 | 1500Ω | |
| R202 | 10K | |
| R203 | 1800Ω 1W | |
| R204 | 10K | |
| R205 | 470K 5% | |
| R206 | 470K 5% | |
| R207 | 220K | |
| R208 | 47K 1W | |
| R209 | 15K | |
| R210 | 10K | |
| R211 | 68K 1W | Note 1 |

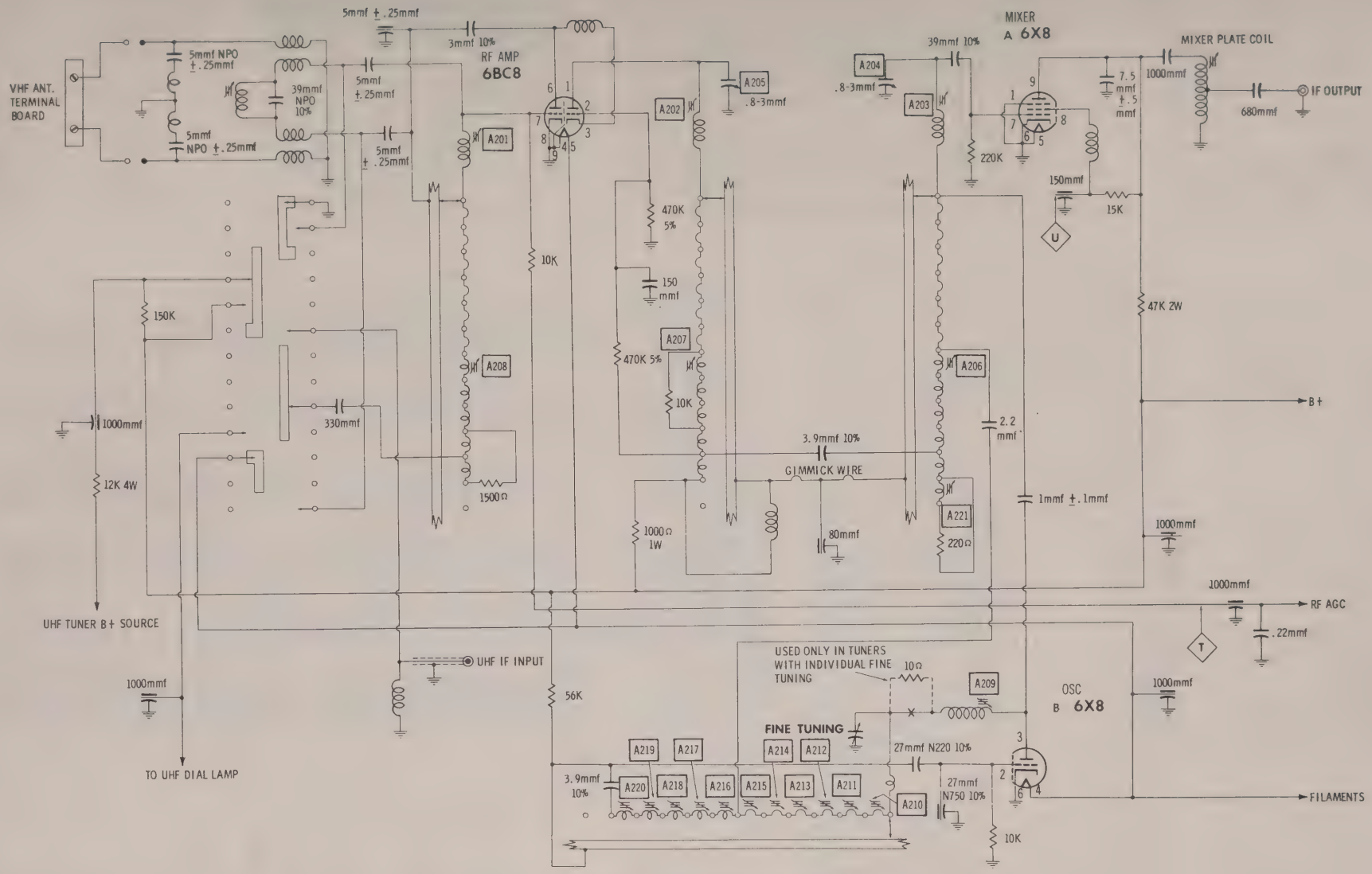
Note 1. Alternate value 56K is used in some versions.

### COILS (RF-IF)

| ITEM No. | USE | PHILCO PART No. | NOTES |
|---|---|---|---|
| L201 | Ant. Coil | 32-4725-3 | |
| L202 | Ant. Coil | 32-4725-3 | |
| L203 | IF Trap | 32-4719-2 | |
| L204 | Ant. Coils | 76-10554 | Channel 2-13, Includes Wafer Assy. |
| L205 | RF Choke | 32-4652-52 | |
| L206 | RF Coils | 76-10555 | Channel 2-13, Includes Wafer Assy. |
| L207 | Mixer Grid Coils | 76-10556 | Channel 2-13, Includes Wafer Assy. |
| L208 | Osc. Coils | 76-10108 | Channel 2-13, Includes Wafer Assy. |
| L209 | Mixer Plate Coil | 32-4629-10 | |

### MISCELLANEOUS

| ITEM No. | PART NAME | PHILCO PART No. | NOTES |
|---|---|---|---|
| | Switch | 42-2088-1 | Off-On |
| | Wrench Extension Shaft | 28-13074 | Part of Pre-Set Fine Tuning Assembly |
| | Pre-Set Plate & Screw Assembly | 76-11735 | Part of Pre-Set Fine Tuning Assembly |




CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

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# VHF TUNER with UHF Provisions 76-10525-2 (T-101C)

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No | CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA — USE | TYPE |
|---|---|---|
| V1 | 1st Video IF Amp. | 6DE6 |
| V2 | 2nd Video IF Amp. | 6DE6 |
| V3 | 3rd Video IF Amp. - Video Det. | 6AM8A |
| V4 | Video Output | 12BV7 |
| V5 | Sync Sep. -Noise Limiter | 12AZ7A |
| V6 | Sound IF Amp. - AGC Clamper | 6BY8 |
| V7 | Audio Detector | 6C9S |
| V8 | Audio Output | 6BQ6 |
| V9 | Vert. Mult. | 6CG7 |
| V10 | Vert. Output | 6DT8 |
| V11 | Horiz. Mult. | 6CG7 |
| V12 | Horiz. Output | 6DQ6/6DQ6A |
| V13 | Damper | 6AU4GTA |
| V14 | 8V Rect. | 1G3GT |
| V15 | LV Rect. | 5U4GB |

## PICTURE TUBE

| ITEM No | REPLACEMENT DATA: PHILCO PART No | GENERAL ELECTRIC PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|
| V16 | 21EAP4/ 21EA4 | | | | 21EAP4/ 21FIA ① | ① "Silver Screen 85" |
| | 24AVP4/ 24F34 | | | | 24AVP4/ 24F34A ① | |

## ELECTROLYTIC CAPACITORS

| ITEM No | RATING: CAP | VOLT | REPLACEMENT DATA: PHILCO PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 40 | 350 | 30-2590-35 | AFH4-114-50 | D0763.6 | FP459 | TMQ-170 | TVL-4818 | |
| B | 40 | 475 | | | | | | | |
| C | 80 | 350 | | | | | | | |
| D | 125 | 25 | | | | | | | |
| C1A | 130 | 350 | 30-2590-34 | AFH4-63-80 | | FP330.22 | TMQ-193 | TVL8-4822.8* | |
| B | 220 | 350 | | | | TC82 | | | |
| C | 40 | 350 | | | | | | | |
| D | 50 | 25 | | | | | | | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA: AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C3 | .1 200V | | P2S8N-1 | DF-104 | CUB3P1 | 2DP-3-104 | GEM-301 | 2TM-P1 |
| C4 | .15 200V | | P2S8N-15 | | CUB3P15 | 2DP-3-154 | GEM-3015 | 2TM-P15 |
| C5 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C6 | .5-3 | | | S39-3 | | CV-1 | CT565 | |
| C7 | 3.3 NPO | | NPO-DI 3.3 | DTZ-3R3 | C10V33C | | CNO-533 | 10TCC-V33 |
| C8 | .5-3 | | | S29-3 | | CV-1 | CT565 | |
| C9 | 1-5 | #31-6535-2 | | S28-5 | | | | |
| C10 | 1000 | | BPD-001 | DD-102 | BYA10S1 | CCD-102 | GP110 | 5HK-D10 |
| C11 | 1-5 | #31-6536-2 | | S29-5 | | | | |
| C12 | 680 | | BPD-00068 | DD-681 | BYA10T68 | CCD-681 | GP368 | 10TS-T68 |
| C13 | 470 | | BPD-00047 | DD-471 | BYA10T47 | CCD-471 | GP347 | 10TS-T47 |
| C14 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP110 | 5HK-D10 |
| C15 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-103 | GP110 | 5HK-D10 |
| C16 | 3.3 | Note 1 | NPO-SI 3.3 | TCZ-3R3 | C10Y33C | CCTO-3R3 | CNO-533 | 10TCC-Y33 |
| C17 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP110 | 5HK-D10 |
| C18 | .1 200V | | P2S8N-1 | DF-104 | CUB3P1 | 2DP-3-104 | GEM-301 | 2TM-P1 |
| C19 | 680 | | BPD-00068 | DD-681 | BYA10T68 | CCD-681 | GP368 | 10TS-T68 |
| C20 | 560 | | DI-560 | DD-561 | L10T56 | CCD-561 | GP356 | 10TS-T56 |
| C21 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP110 | 5HK-D10 |
| C22 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP110 | 5HK-D10 |
| C23 | 5 | | NPO-DI 5 | DD-050 | L10V5 | CCD-050 | GP550 | 10TS-V50 |
| C24 | .047 200V | | P2S1N-047 | DD-503 | BC2S47J | 4DP-3-473 | ACE8147 | 2SE-S47 |
| C25 | .0033 400V 10% | | V94C4D33-10% | | PME1033 | 6DP-1-332 | GEM-16233 | 6TM-D33 |
| C26 | .1 400V | | P4S1N-1 | DF-104 | BC6P1J | 4DP-3-104 | ACE401 | 4SE-P10 |
| C27 | 470 | | BPD-00047 | DD-471 | BYA10T47 | CCD-471 | GP347 | 10TS-T47 |
| C28 | 8200 | | DAC-26 | HVE1826 | DD-823 | DAC-260 | GP382 | 5TM-D8 |
| C29 | 4700 | | BPD-0047 | DD-472 | BYA10D47M | CCD-472 | GP247 | 5HK-D47 |
| C30 | 100 | | BPD-001 | DD-101 | L10T1 | CCD-101 | GP310 | 10TS-T10 |
| C31 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP110 | 5HK-D10 |
| C32 | .1 200V | | P2S1N-1 | DF-104 | BC2P1J | 2DP-3-104 | ACE401 | 2SE-P10 |
| C33 | 1500 | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | GP115 | 5HK-D15 |
| C34 | 27 | | DI-27 | DD-270 | L10Q27 | CCD-270 | GP427 | 10TS-Q27 |
| C35 | .0047 400V | | P4S8N-0047 | DS-473 | CUB6D47 | 6DP-1-472 | GEM-6247 | 6TM-D47 |
| C36 | .01 400V | | P4S8N-01 | DS-103 | CUB4S1 | 4DP-1-103 | GEM-411 | 4TM-S1 |
| C37 | 220 | | SI 220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C38 | 4700 (6800mmf) * | | BPD-0047 | DD-472 | BYA10D47M | CCD-472 | GP347 | 5HK-D47 |
| C39 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP110 | 5HK-D10 |
| C40 | .1 200V | | P2S1N-1 | DF-104 | BC2P1J | 2DP-3-104 | ACE401 | 2SE-P10 |
| C41 | .01 400V | | P4S8N-01 | DS-103 | CUB4S1 | 4DP-1-103 | GEM-411 | 4TM-S1 |
| C42 | 18000 | | BPD-03 | DD-203 | BYB6S3 | CCD-203 | GP103 | 5HK-S20 |
| C43 | .0033 400V 10% | | V94C4D33-10% | | PME6D33 | 6DP-1-332 | GEM-16233 | 6TM-D33 |
| C44 | 680 | | BPD-00068 | DD-681 | BYA10T68 | CCD-681 | GP368 | 10TS-T68 |
| C45 | .15 400V | | P4S1N-15 | | BC2P15J | 4DP-4-154 | ACE6015 | 4SE-P15 |
| C46 | .1 400V | | P4S1N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C47 | .033 400V | | P4S8N-033 | DD-303 | BC6S3J | 4DP-2-333 | ACE6133 | 4SE-S33 |
| C48 | .068 200V | | P2S8N-068 | | CUB4S68 | 4DP-3-683 | GEM-4168 | 4TM-S68 |
| C49 | 3300 | | BPD-0033 | DD-332 | BYA10D33 | CCD-332 | GP233 | 5HK-D33 |
| C50 | .0039 500V 10% | | V94C5D4-10% | | PME104 | 6DP-1-392 | GEM-16234 | 6TM-D34 |
| C51 | 56 10% | | 1469-000056 | TCZ-56 | 22R5Q56 | CM-20B-560K | CNO-456 | MS-456 |
| C52 | 390 10% | | 1469-00039 | DD-390 | 5RST39 | CM-20B-391K | MCB243 | MS-339 |
| C53 | .01 400V | | P4S8N-01 | DS-104 | CUB4S1 | 4DP-1-103 | GEM-411 | 4TM-S1 |
| C54 | 560 10% | | 1469-00056 | DD-561 | 1R5T56 | CM-20B-561K | MCJ347 | MS-356 |
| C55 | .1 400V | | P4S1N-1 | DF-104 | BC6P1J | 4DP-3-104 | ACE401 | 4SE-P10 |
| C56 | .022 500V | | P4S8N-022 | DD-303 | CUB4S22 | 6DP-2-223 | GEM-6122 | 6TM-S22 |
| C57 | 330 | | BPD-00033 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C58 | 100 5000V | Note 2 | HVD-50-100 | DD50-101 | HVB50T1 | 5CCD-101 | 5HV-310 | 50CA-T10 |
| C59 | .047 600V | | P6S8N-047 | DD-503 | CUB6S47 | 6DP-3-473 | GEM-6147 | 6TM-S47 |

* Alternate value. ◊ Philco Part No.
Note 1. Not used in some versions. Note 2. 82mmf used with 24AVP4/3F34.

## CONTROLS

| ITEM No. | RATING: RESISTANCE | WATTS | REPLACEMENT DATA: PHILCO PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS - IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 2.5meg | | 33-5592-31 | | RTV-675 | ◊ QJ-1157 | | Contrast |
| B | 1meg | | | | Not Req. | | | Volume, Tap ③ 500K |
| R2A | 2meg | | 33-5593-30 | B-75 | A47-2meg-S | Q11-139 | U56 | Vert. Hold |
| B | Shaft | | | Not Req. | F8-3 | Not Req. | Not Req. | |
| R3A | 30K | | 33-5593-19 | B-38 | A47-30K-S | Q11-121 | U39 | Horiz. Hold |
| B | Shaft | | | Not Req. | F8-3 | Not Req. | Not Req. | |
| R4A | 100K | | 33-5593-18 | B-40 | A47-100K-S | Q11-126 | U41 | Brightness |
| B | Shaft | | | Not Req. | F8-3 | Not Req. | Not Req. | |
| R5 | 5meg | | 33-5593-17 | | | | | Tone, Tap ④ 2.5meg |
| R6 | 750Ω | | 33-5575-16 | | | | | Vert. Lin. |
| R7A | 75K | | 33-5595-2 | | | | | Horiz. Freq. |
| B | 2.5meg | | | | | | | Height |
| R8 | 12.5K | 2(WW) | 33-5596-1 | | | | | Width |

◊ "Concentrikit"Equivalent: K-8 Kit with Base Elements & Shafts: B17-239, P17-028 (Panel) B19-137X, R1-111 (Rear) R-5 (Retainer)

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise stated.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R9 | 1meg | |
| R10 | 1.5meg | |
| R11 | 4.7meg | |
| R12 | 1000Ω | |
| R13 | 15meg | |
| R14 | 200K | |
| R15 | 75K 5% | |
| R16 | 100K | |
| R17 | 22K | |
| R18 | 1000Ω | |
| R19 | 27K | |
| R20 | 1000Ω | |
| R21 | 22K | |
| R22 | 47Ω | |
| R23 | 180K | |
| R24 | 220K | |
| R25 | 15K | |
| R26 | 1000Ω | |
| R27 | 330Ω | |
| R28 | 330Ω | |
| R29 | 120Ω | |
| R30 | 1meg | |
| R31 | 1.2meg | |
| R32 | 1meg | |
| R33A | 820K | #30-6516-4 |
| B | 8.6meg | |
| C | 3.3meg | |
| D | 3300Ω | |

* Alternate value.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R34 | 470K | |
| R35 | 150Ω | |
| R36 | 68Ω | |
| R37 | 12K 4W | #33-1363-11 |
| R38 | 18000 2W | |
| R39 | 3900Ω 7W | #33-3449-4 |
| R40 | 33K | |
| R41 | 100K | |
| R42 | 5600Ω | |
| R43 | 47K | |
| R44 | 27K 1W | |
| R45 | 5600Ω 5% | |
| R46 | 47K | |
| R47 | 15K | |
| R48 | 330Ω | |
| R49 | 1500Ω | |
| R50 | 10K 2W | |
| R51 | 15K | |
| R52 | 270Ω | |
| R53 | 68K | |
| R54 | 1000Ω 2W | |
| R55 | 330Ω | |
| R56 | 470K | |
| R57 | 4.7meg | |
| R58 | 56K | |
| R59 | 27K | |
| R60 | 5800Ω | |
| R61 | 220K 1W | |

◊ Philco Part No.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R62 | 5600Ω 5% | |
| R63 | 820K | |
| R64 | 6.3meg | (6.8meg) * |
| R65 | 1.5meg | |
| R66 | 8.4meg | |
| R67 | 56K 2W | |
| R68 | 3300Ω 1W | |
| R69 | 1000Ω | |
| R70 | 1000Ω | |
| R71 | 3.8Ω (Cold) | #33-1343-10 |
| R72 | 68K | |
| R73 | 15K 1W | |
| R74 | 910Ω 5% | #66-1916240 |
| R75 | 39K | |
| R76 | 3300Ω | |
| R77 | 5000Ω 7W | #33-1363-23 |
| R78 | 10Ω | |
| R79 | 560Ω | |
| R80 | 1500Ω | |
| R81 | 56K 2W | |
| R82 | 3000Ω 7W | #33-1363-36 |
| R83 | 1000Ω 1W | |
| R84 | 470K | |
| R85 | 72 7W | #33-1335-147 |
| R86 | 100K 1W | |
| R87 | 1meg | |

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA: PHILCO PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No | NOTES |
|---|---|---|---|---|---|---|---|---|
| L1 | 47.25MC Trap Coil | 32-4645-32 | 19-1001 | 19-1001 | BC-562 | 4604 | | |
| L2 | 47.25MC Trap Coil | 32-4645-19 | | | | | | |
| L3 | 41.25MC Trap Coil | 32-4645-34 | | | | | | |
| L4 | RF Choke | 32-4645-41 | | | | | | |
| L5 | 1st Video IF Coil | 32-4645-36 | 19-3001 | 19-3001 | TV-189 | 6175 | VP-9 | |
| L6 | 2nd Video IF | 32-4686-2 | | | | | | |
| L7 | 3rd Video IF | 32-4696-3 | | | | | | |
| L8 | 4th Video IF | 32-4696-4 | | | | | | |
| L9 | Resonant Choke | 32-4674-1 | | | | | | |
| L10 | Resonant Choke | 32-4645-7 | | | | | | |
| L11 | Variable Shunt Peaking | 32-4694-11 | | | | | | |
| L12A | Sound Take-Off | 32-4688-5 | | | | | | |
| B | 4.5MC Trap | | | | | | | |
| L13 | Shunt Peaking Coil | 32-4762-9 | 19-3275 | 19-3275 | TV-198 | 6130 | VP-8 | 270uh |
| L14 | Series Peaking Coil | 32-4762-8 | 19-4301 | 19-4301 | TV-197 | 6154 | | 220uh |
| L15 | Sound IF | 32-4745-2 | | | | | | |
| L16 | Quadrature Coil | 32-4644-20 | | | | | | |
| L17 | Resonant Choke | 32-4112-60 | | | | | | 82MC |
| L18 | Resonant Choke | 32-4112-60 | | | | | | 82MC |
| L19 | Fil. Choke | 32-4645-40 | | | | | | |

## TRANSFORMER (HORIZ. OSC.)

| ITEM No. | DC RES.: PRI. | SEC. | REPLACEMENT DATA: PHILCO PART No. | Halldorson PART No. | Merit PART No. | Miller PART No. | Ram PART No. | Thordarson PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| L20 | 150Ω | | 32-4754-3 | | | | | | Horiz. Stabilizing |

## FILTER CHOKE

| ITEM No. | RATINGS: CURRENT (Measured) | DC RES. | INDUCTANCE (0 CURRENT 1000 ^C.) | REPLACEMENT DATA: PHILCO PART No | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| L21 | .250A | 41Ω | 1.3 Hy. | 32-4710-5 | 28C44 | | | | 28C44 | C-28X |

## TRANSFORMER (POWER)

| ITEM No | RATING: PRI | SEC 1 | SEC 2 | REPLACEMENT DATA: PHILCO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No | Stancor PART No. | Thordarson PART No. | Triad PART No |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V & 1.9A | 580VCT & 280A | 5V & 3A | 32-8845-4-A ① | | | | | | |
| | | SEC 3 | SEC 4 | SEC 5 | | | | | | |
| | 6.3V & 10A | | | | | | | | | |

① Alternate Part #32-8845-4.

## TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No. | USE | REPLACEMENT DATA: PHILCO PART No | Halldorson PART No. | Merit PART No | Ram PART No | Rogers PART No | Stancor PART No | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|
| T2 | Vert. Output | 32-8852-2 | 28875 ① | A-2815 ① | | | VO-109 ③ | 28875 ③ | A-108X |
| T3 | Yoke-Horiz. (24MH) (210^2)-Vert. (38MH) | 76-10508-4 ② | | | | | | | |
| | Alt. Yoke | 76-10508-5 ② | | | | | | | |
| | Rear Cover & Centering Device | 76-10513-8 ② | | | | | | | |
| | Rear Cover & Centering Device | 76-10720 ③ | | | | | | | |
| T4 | Horiz. Output | 32-8840-2 | | | | | | | |

① Use 5 : 1 turns ratio. ② Used in Models with 21" Picture Tube. ③ Used in Models with 24" Picture Tube.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE: PRI. | SEC. | REPLACEMENT DATA: PHILCO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T5 | 10.5K | 3-4Ω | 32-8908-1 | 34898 | A-2932 | AU-808 | A-3879 | 34898 | S-17X | |

## SPEAKER

| ITEM No. | TYPE: SIZE | FIELD | V. C. IMP. | REPLACEMENT DATA: PHILCO PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 6" x 9" | PM | 10-13Ω | 36-1679-3 | 69A2210 | ① Not used in some versions. |
| SP2 | 5" | PM | 8-10Ω | 36-1669-10 | 52A212G9 | |
| SP3 | 5" | PM | 8-10Ω | 36-1669-10 ① | 52A212G9 | |

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | PHILCO PART No. | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| K1 | 2nd Video IF Cathode | 15mmf, 6Ω | 30-5039-1 | Sprague | PRC-12 |
| K2 | Vert. Retrace | 2000mmf, 1000mmf, 10K, 330K | 30-5034-2 | Sprague | RS-5 |
| K3 | Audio Detector Grid | 150mmf, 15K | 30-5031-2 | Sprague | PRC-7 |
| K4 | Audio Coupling | 100mmf, 4700mmf, 470K, 1.5meg | 30-5032-3 | Sprague | T-12 |
| K5 | Sync Sep. Grid | 470mmf, 3300mmf, 22K, 100K, 220K, 1.5meg | 30-5517-3 | | |
| K6 | Vert. Integrator | 4000mmf, 10000mmf, 10000mmf, 10K, 10K, 1meg | 30-5008-2 | Sprague | V-6 |
| K7 | Horiz. AFC | 82mmf, 100mmf, 100mmf, 2000 mmf, 2000mmf, 330K, 1meg, 1meg | 30-5033-2 | Sprague | C-9 |
| K8 | Horiz. Circuit | 470mmf, 47000, 10K, 39K, 1meg | 30-5533-1 | | |

## RECTIFIERS

| ITEM No. | RATING: CURRENT (Measured) | REPLACEMENT DATA: PHILCO PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | | 34-8037 * | SD-91 * | K1615 * | | | * Dual Sel. Diode ** Sil. Diode, 2 required |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA: PHILCO PART No.: FUSE | HOLDER | LITTELFUSE PART No.: FUSE | HOLDER | BUSS PART No.: FUSE | HOLDER |
|---|---|---|---|---|---|---|---|---|
| M2 | N | 7/10A 250V S/B | 27-8318-1 | 27-8317-6 | 333.600 (N 7/10A 250V S/B) | 346010 | N 7/10 | HN 1/2 to 3/4 |
| M3 | 1½" | Length | #26 Wire | | | | | |

PHILCO CHASSIS 10L60, 10L60R, 10L60UR

FOLDER 2

# PARTS LIST AND DESCRIPTIONS (Continued)

## MISCELLANEOUS

| ITEM No. | PART NAME | PHILCO PART No. | NOTES |
|---|---|---|---|
| M4 | Tuner | 76-10524-2 | VHF (T-100C) |
| | Tuner | 76-10525-2 | VHF-UHF (T-101C) |
| | Tuner | 76-10526-3 | UHF (T-28D) |
| M5 | Switch | 42-2063-4 | Range |
| | Printed Board | 54-6993 | Video IF |
| | Printed Board | 54-6579 | Video & Sound |
| | Printed Board | 54-6578-1 | Deflection |

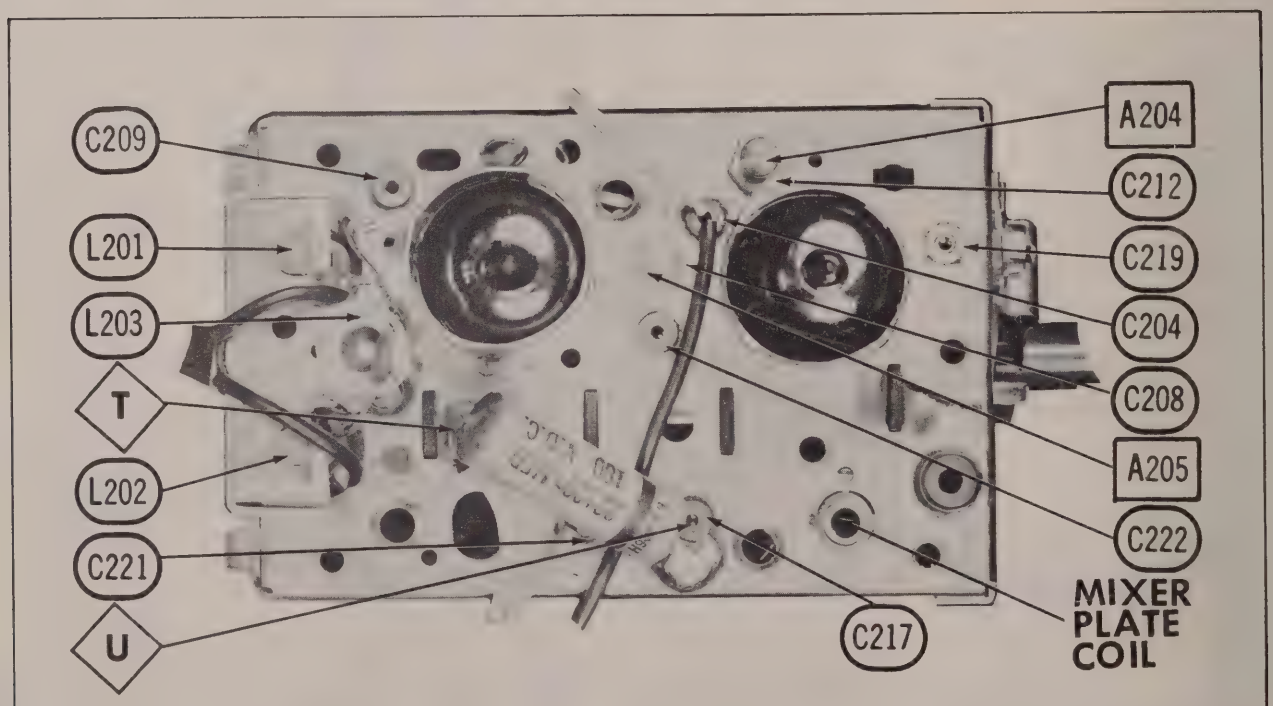
## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

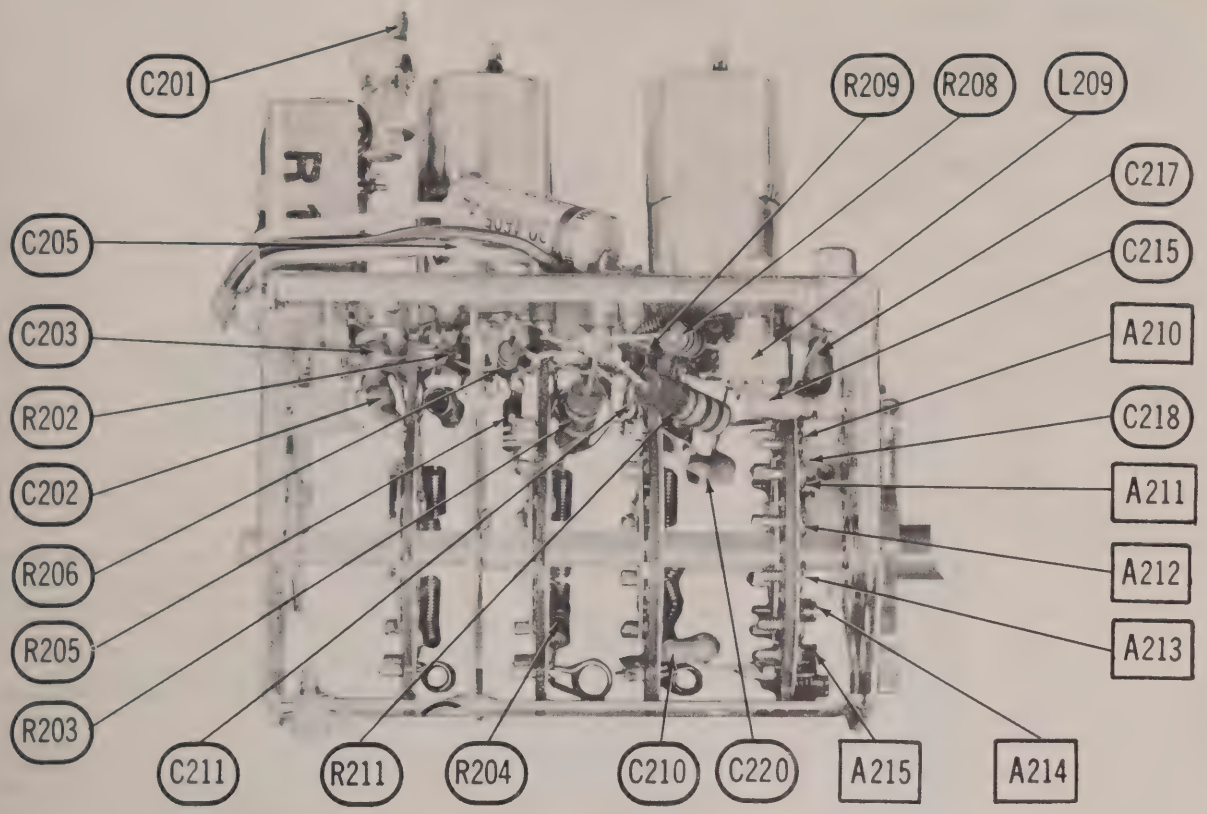
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Safety glass | 54-9213-76 | |
| Mask | 54-6695-2 | Models H4686S, SR, UH4686S, SR |
| Mask | 54-6695-3 | Models H4686SL, SLR, UH4686SL, SLR |
| Mask | 54-6727-4 | Models H6636SR, UH6636SR |
| Mask | 54-6727-5 | Models H6636SLR, SWR, UH6636SLR, SWR |
| Knob | 76-11702-1 | Channel Selector, Models UH4686S, SL, SR, SLR, UH6636SR, SLR, SWR |
| Knob | 76-11702 | Channel Selector, Models UH4686S, SL, SR, SLR, UH6636SR, SLR, SWR |
| Knob | 76-1170 | Channel Selector, Model H4686SL |
| Knob | 76-11702 | Channel Selector, Models H4686SR, H4686SLR |
| Knob | 424-8073 | UHF, Models UH4686S, SR, UH6636SR |
| Knob | 424-8072 | UHF, Models U4686SLR, UH6636SLR, SWR |
| Knob | 54-8072 | UHF, Model UH4686SL |
| Knob | 54-5395-1 | Fine Tuning, Models UH4686S, SL, SR, SLR, UH6636SR, SLR, SWR |
| Knob | 28-13051 | Fine Tuning, Preset |
| Knob | 54-6736-1 | Off-On Volume |
| Knob | 54-6405-3 | Brightness, Vert. Hold, Horiz. Hold , Tone |
| Knob | 54-6735-1 | Contrast |
| Knob | 54-6483-3 | Range Switch |

## WIRING DATA

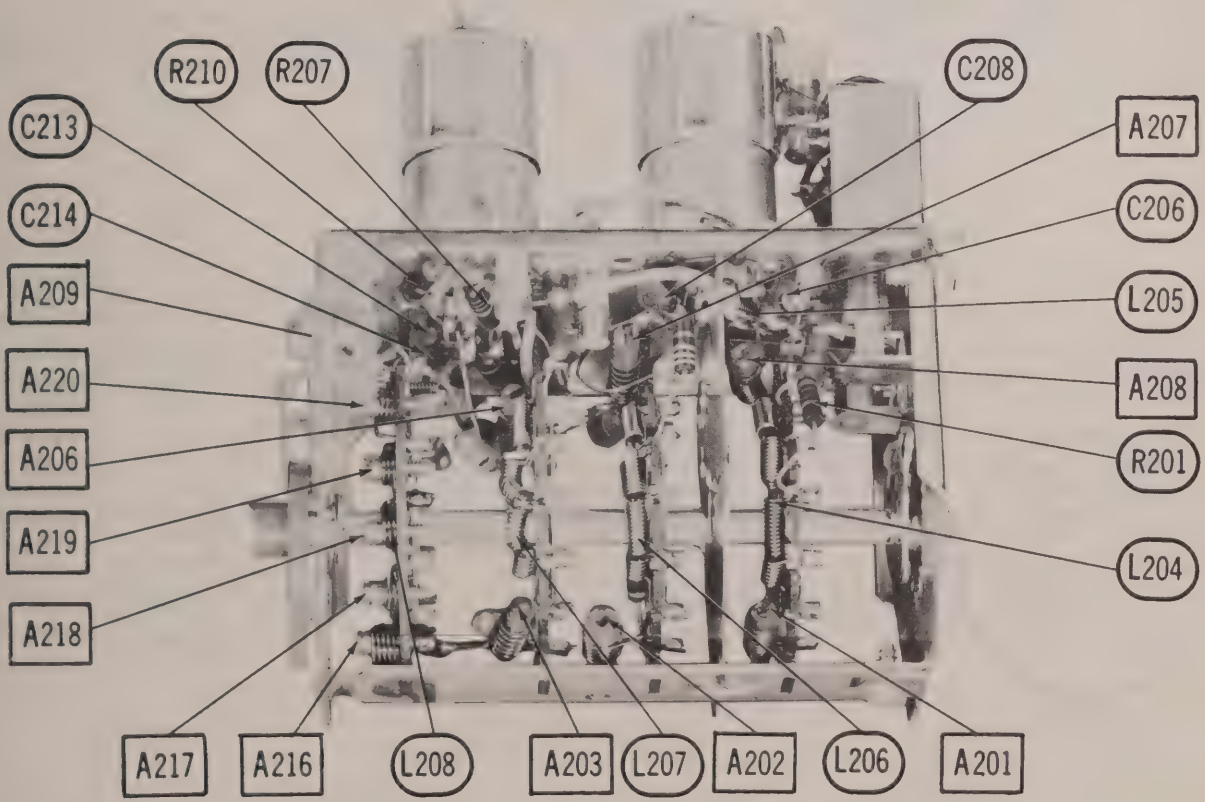
| | | |
|---|---|---|
| High Voltage Lead | Use BELDEN No. | 8869 |
| Shielded Hook-up Wire | Use BELDEN No. | 8885 (Single Conductor) |
| | | 8738 (Two Conductor) |
| General-use Unshielded Hook-up Wire | Use BELDEN No. | 8530 (Solid) Available in Ten Colors |
| | | 8524 (Stranded) Available in Ten Colors |
| Power Cord (Interlock Type) | Use BELDEN No. | 8874 |
| 300Ω Tuner Input Lead | Use BELDEN No. | 8225 |
| 300Ω Antenna Lead-in | Use BELDEN No. | 8230 or 8275 |
| Antenna Rotor Cable | Use BELDEN No. | 8464 (Flat) or 8484 (Round) - 4 Conductor |
| | | 8485 (Round) - 5 Conductor |
| | | 8488 (Round) - 8 Conductor |




TUNER 76-10524-2 (T-100C) – TOP VIEW




TUNER 76-10524-2 (T-100C) - LEFT SIDE




TUNER 76-10524-2 (T-100C) - RIGHT SIDE

# TUNER ALIGNMENT INSTRUCTIONS
## T-100C, T-101C

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools:

| | |
|---|---|
| A201, A202, A203, A206, A207, A208, A221 | General Cement #5009, 8195, 8274, 8275, 8728, 8987<br>Walsco #2531 |
| A204, A205 | General Cement #5000, 5003, 5009, 8290<br>Walsco #2520, 2523, 2525, 2537 |
| A209 thru A220 | General Cement #8729, 8988, 8989, 9294<br>Walsco #2532, 2538 |
| Mixer Plate Coil | General Cement #8606, 8606L, 8282, 9295<br>Walsco #2526, 2543, 2544, 2545 |

VHF RF AND MIXER ALIGNMENT

Set Range switch to "Normal".
Connect the negative lead of a 1.5 volt bias supply to point (T). Positive to chassis.
Detune the Mixer Plate coil by connecting a 10 to 20mmf capacitor across it.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | Two 120Ω Carbon Resistors | Across VHF antenna terminals with 120Ω in each lead. | 213MC | 210MC | 13 | Vert. Amp. thru 10K to point (U). Low side to chassis. | A201 | Adjust for maximum amplitude. |
| 2. | " | " | " | 211.25MC | " | " | A202, A203 | Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown. Adjust A202 to set marker level, A203 for proper tilt. |
| 3. | " | " | 177MC | 174.0MC<br>180.0MC | 7 | " | A204, A205 | Adjust for tilt as shown in Fig. 202. Recheck step 2 and retouch, if necessary. Repeat step 3. |
| 4. | " | " | 85MC | 82.0MC<br>85.0MC<br>88.0MC | 6 | " | A206, A207, A208 | Turn A206 counterclockwise until a single peak appears. Adjust A207 until peak falls at 85MC. Adjust A208 for maximum gain and symmetry of single peak. Retouch A206 and A207 for symmetrical response centered about 85MC. |

VHF OSCILLATOR ALIGNMENT

Set the Fine Tuning to the center of its range.
This procedure uses the traps of the Video IF strip. Make certain Video IF Alignment is correct.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 5. | Two 120Ω Carbon Resistors | Across VHF antenna terminals with 120Ω in each lead. | 209.75MC (400~ 30% AM Mod) | 13 | Across Video Detector load | A209 | Adjust for MINIMUM scope indication. |
| | | | 203.75MC | 12 | | A210 | |
| | | | 197.75MC | 11 | | A211 | |
| | | | 191.75MC | 10 | | A212 | |
| | | | 185.75MC | 9 | | A213 | |
| | | | 179.75MC | 8 | | A214 | |
| | | | 173.75MC | 7 | | A215 | |
| | | | 81.75MC | 6 | | A216 | |
| | | | 75.75MC | 5 | | A217 | |
| | | | 65.75MC | 4 | | A218 | |
| | | | 59.75MC | 3 | | A219 | |
| | | | 53.75MC | 2 | | A220 | |

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

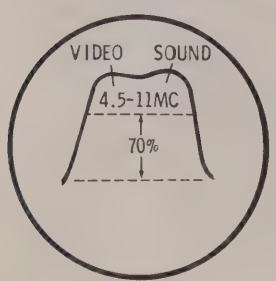
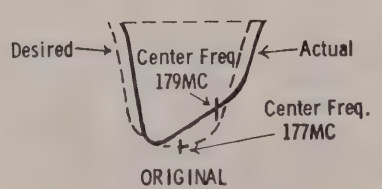


FIG.201



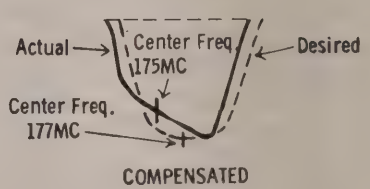
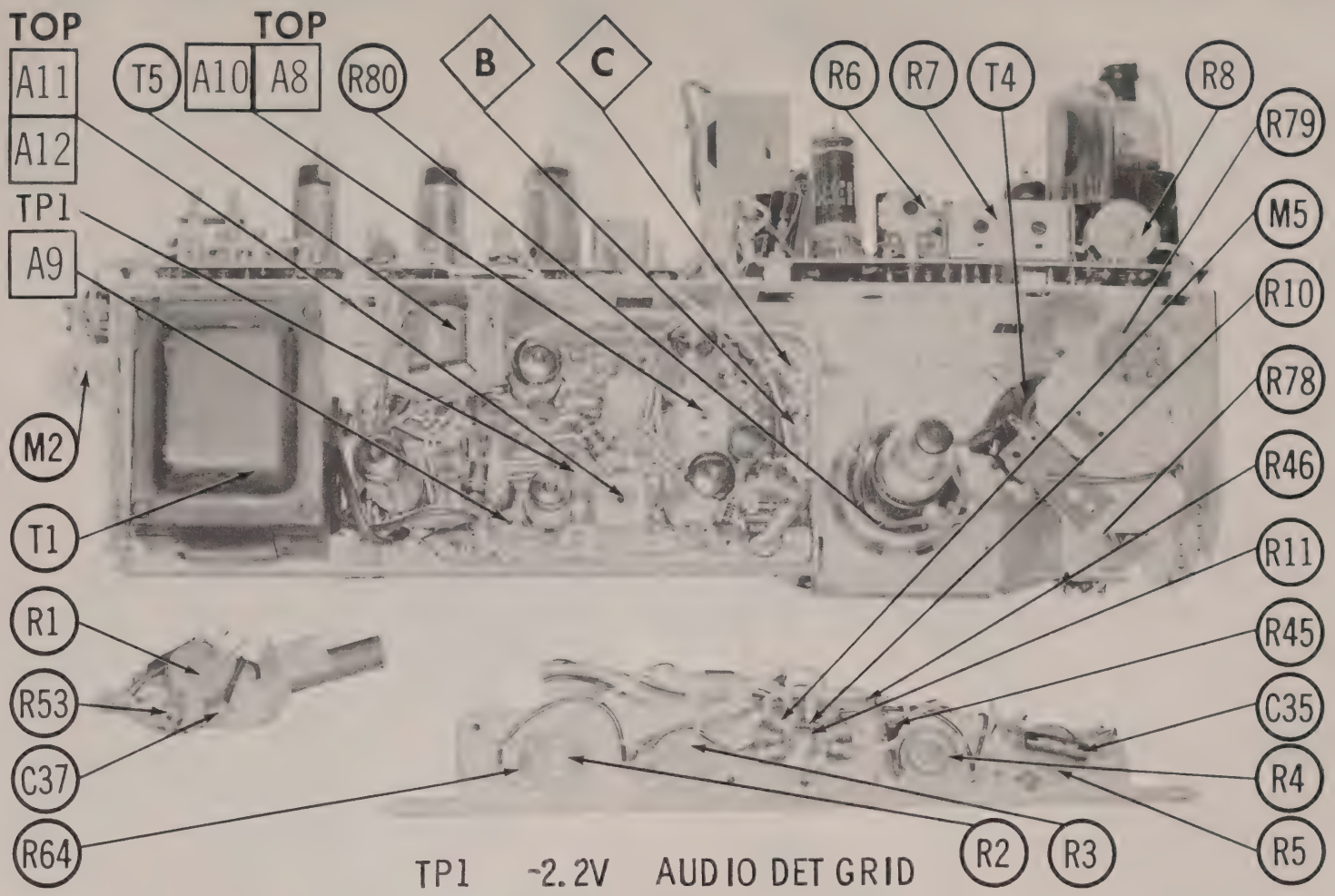



FIG.202

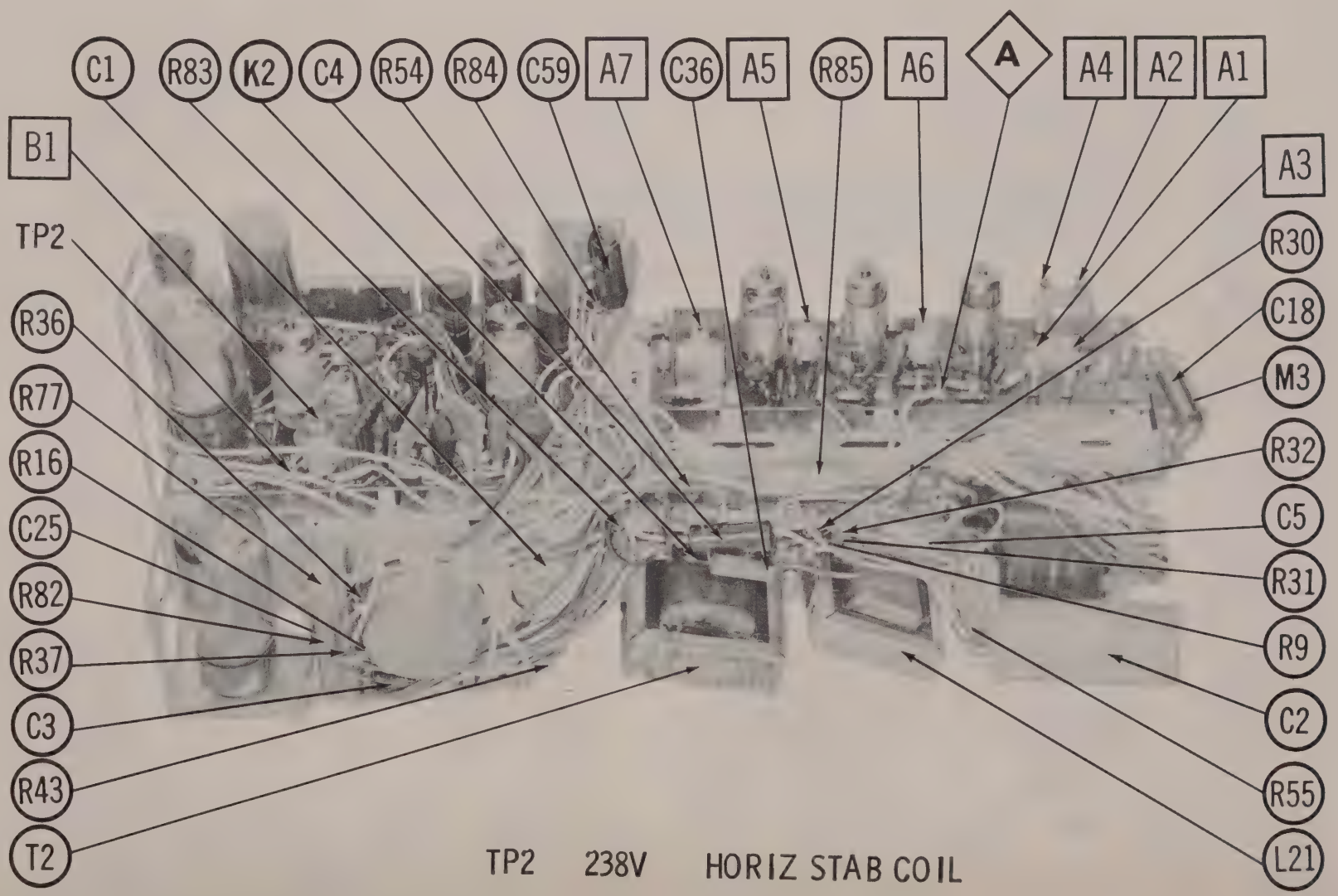



CHASSIS - REAR VIEW

PHILCO CHASSIS
10L60, 10L60R, 10L60UR

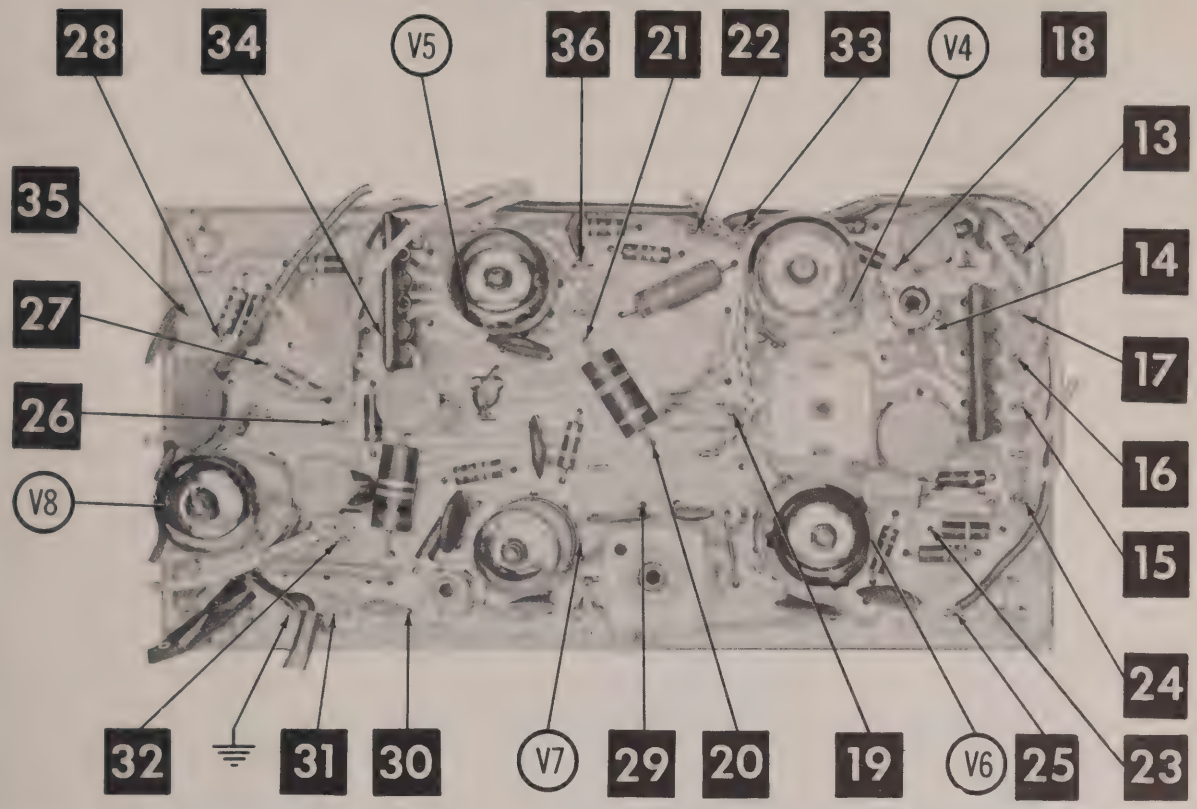
FOLDER 2

PAGE 15




CHASSIS - FRONT VIEW

CircuiTrace Numbers 13 thru 36

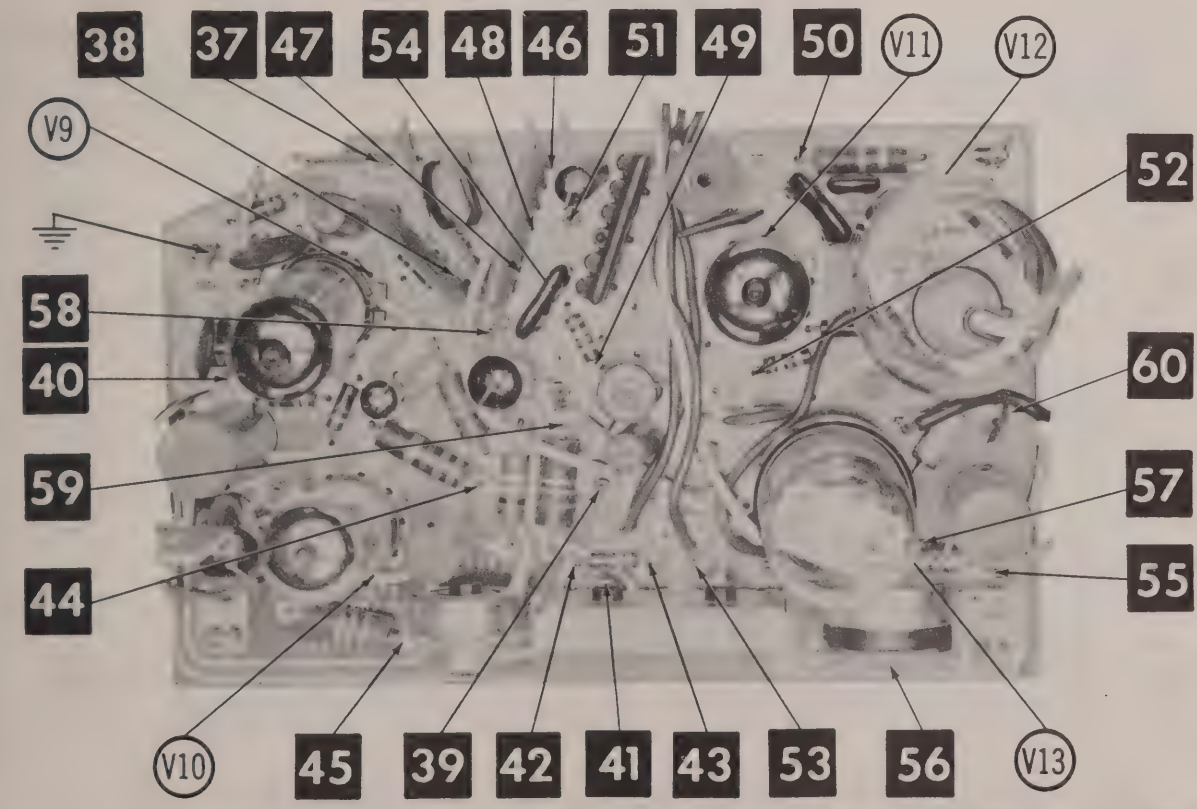



A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VIDEO, SOUND PRINTED BOARD

CircuiTrace Numbers 37 thru 60




A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

SWEEP PRINTED BOARD

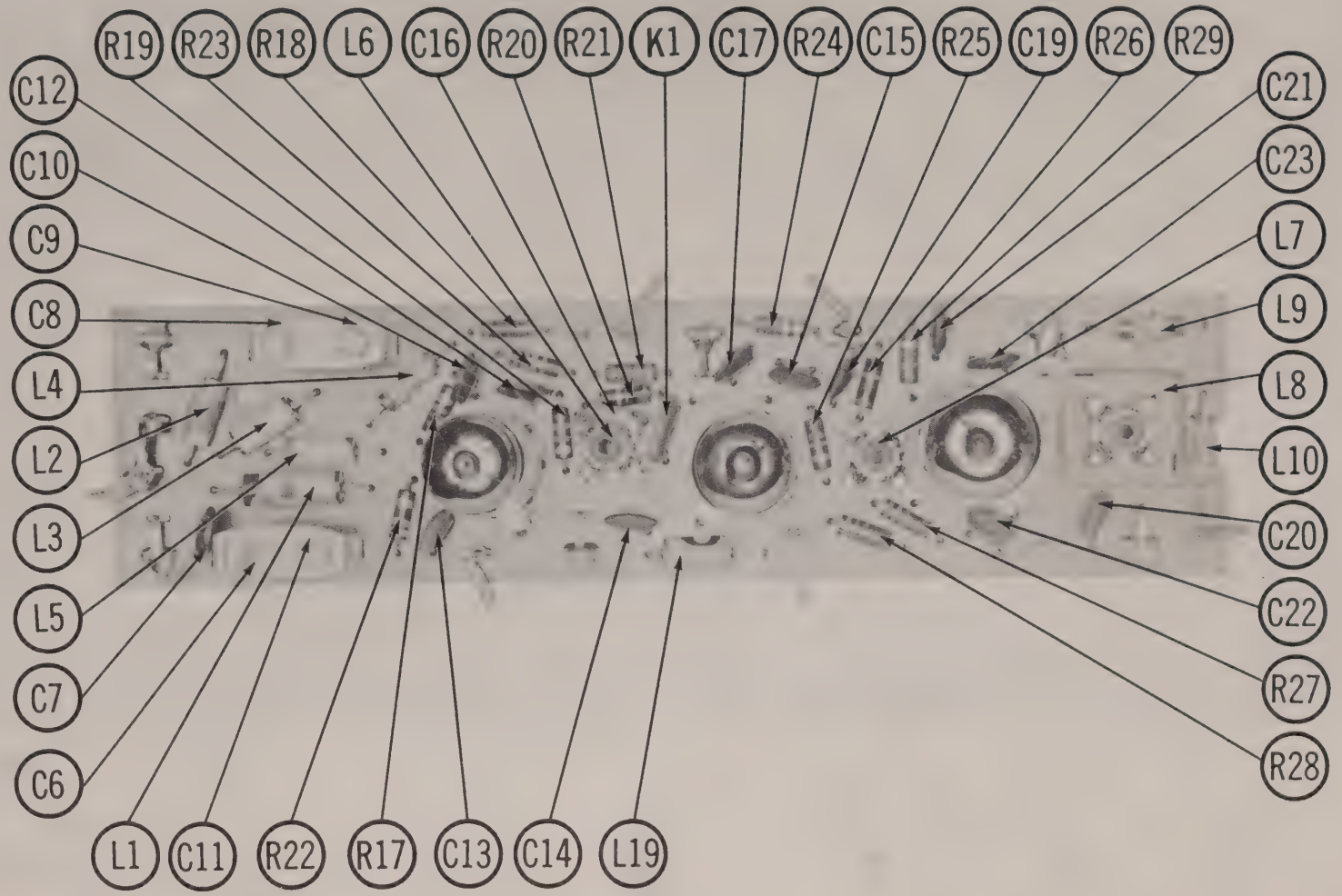
# RESISTANCE MEASUREMENTS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6DE6 | 1meg | 47Ω | .1Ω | 0Ω | ▲ 1000Ω | ▲ 1000Ω | 0Ω | | |
| V2 | 6DE6 | ▲ 20K | ▲ 68Ω | .1Ω | 0Ω | † 1000Ω | † 1000Ω | 100K | | |
| V3 | 6AM8A | 120Ω | .3Ω | † 3600Ω | .1Ω | 0Ω | † 3600Ω | .2Ω | 3300Ω | 0Ω |
| V4 | 12BV7 | 68Ω | 470K | 0Ω | .1Ω | .1Ω | 0Ω | † 5700Ω | † 3000Ω | 0Ω |
| V5 | 12AZ7A | † 100K | 3.2meg | 5000Ω | .1Ω | .1Ω | † 27K | 1.7meg | 0Ω | 0Ω |
| V6 | 6BY8 | 5.5Ω | 0Ω | 0Ω | .1Ω | 0Ω | 1.2meg | † 15K | † 15K | 330Ω |
| V7 | 6CS6 | 15K | 270Ω | .1Ω | 0Ω | † 450K | † 11K | 3.1Ω | | |
| V8 | 6BQ5 | 0Ω | 0Ω | 330Ω | 0Ω | .1Ω | NC | † 1630Ω | TP | † 1000Ω |
| V9 | 6CG7 | † 275K | 1meg | 560Ω | 0Ω | .1Ω | ● † 2.2meg | ● 1.6meg | 560Ω | 0Ω |
| V10 | 6DT5 | † 0Ω | NC | ● † 4.2meg | 0Ω | .1Ω | ● † 4.2meg | ● 550Ω | NC | † 380Ω |
| V11 | 6CG7 | † 16K | 1.2meg | 910Ω | .1Ω | 0Ω | † 45K | ● 90K | 910Ω | 0Ω |
| V12 | 6DQ6/ 6DQ6A | NC | 0Ω | NC | ● † 14K | 1meg | NC | .1Ω | 0Ω | TOP CAP † 24Ω |
| V13 | 6AU4GTA | NC | NC | ¶ 160K | NC | † 2Ω | NC | .1Ω | 0Ω | |
| V14 | 1G3GT | PINS 1 THRU 8 HAVE INFINITE RESISTANCE | | | | | | | | TOP CAP † 394Ω |
| V15 | 5U4GB | NC | ¶ | NC | 25Ω | NC | 24Ω | NC | ¶ | |
| V16 | 21EAP4/ SF 21A | 0Ω | NC | 330K | 0Ω | NC | † 100K | ● 110K | .1Ω | |
| V201 | 6BC8 | † 2000Ω | 250K | INF | .1Ω | 0Ω | INF | 1.8meg | 0Ω | 0Ω |
| V202 | 6X8 | 0Ω | 10K | † 57K | 0Ω | .1Ω | 0Ω | 220K | † 63K | † 48K |
| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM 260V SOURCE.
† MEASURED FROM PIN 3 OF V13.

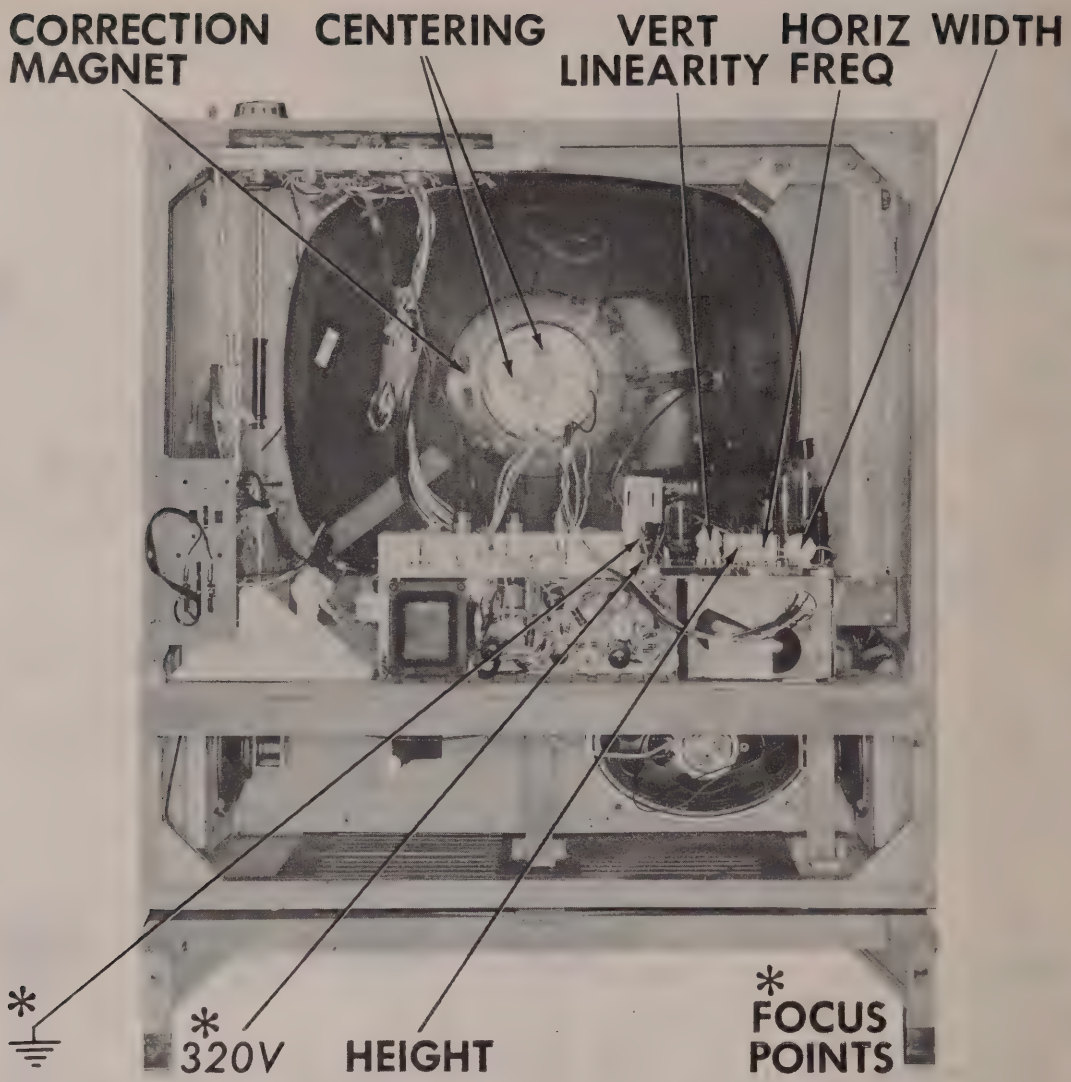
NC NO CONNECTION.
TP TIE POINT.

SWEEP PRINTED BOARD




VIDEO IF PRINTED BOARD

PHILCO CHASSIS
10L60, 10L60R, 10L60UR




CABINET—REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a station signal. Allow the receiver to warm up. Connect a clip lead across the Horizontal Frequency coil (L20).

Set the Horizontal Hold to the center of its range.

Adjust the Horizontal Frequency control (R7A) until the picture appears to float back and forth across the screen.

Remove the clip lead from across L20 and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally.

Adjust the Width (R8) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

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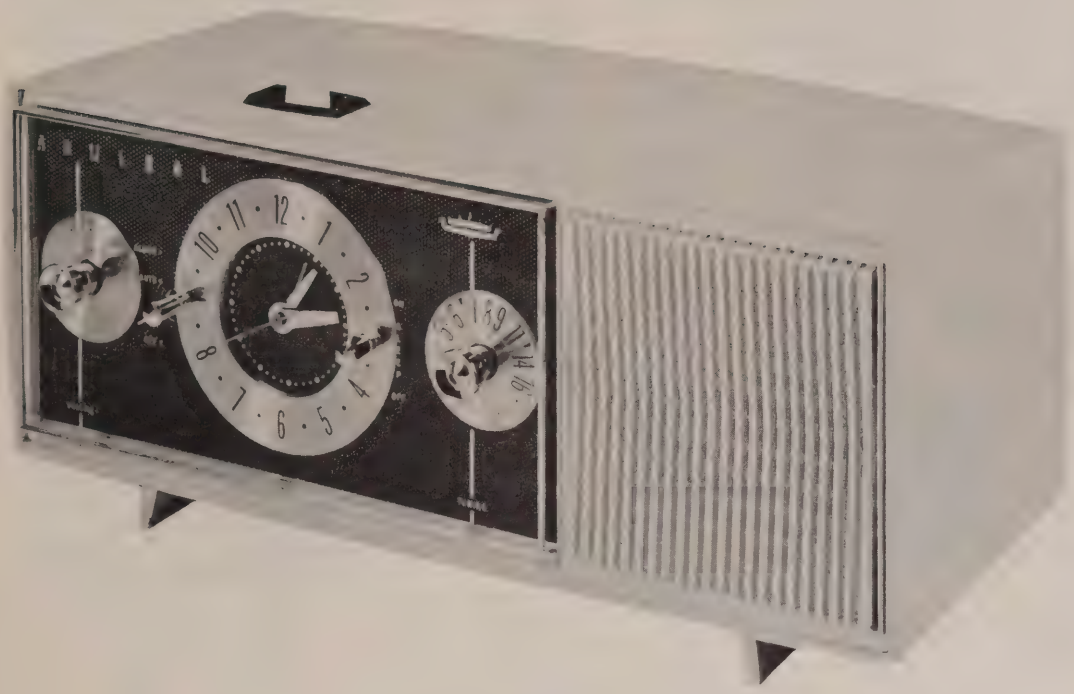
EIA MEMBER

# ADMIRAL CHASSIS 5A5, 5D5, 5L5

ADMIRAL CHASSIS 5A5, 5D5, 5L5



ADMIRAL CHASSIS 5A5, 5D5, 5L5

| | |
|---|---|
| TRADE NAME | Admiral Models Y833, Y837, Y838, Y839 (Ch. 5L5); Y846, Y847, Y848, Y849 (Ch. 5A5); Y873, Y875, Y878 (Ch. 5D5) |
| MANUFACTURER | Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois |
| TYPE SET | AC Operated 5 Tube AM Receiver (Models Y873, Y875, Y878 Are Clock Versions) |
| POWER SUPPLY | 110-120 Volts AC |
| RATING | 24 Watts, .23 Amp. @ 117 Volts AC (Less Clock) |
| TUNING RANGE—BROADCAST | 535 – 1620KC |

## ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A4.....GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | High side thru .1mfd to antenna stator lug of tuning gang. | 455KC (400~ Mod.) | Tuning gang fully open. | Across voice coil. | A1, A2, A3, A4 | Adjust for maximum output. |
| 2. | Loop | 1620KC | " | " | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | " | 1400KC | Tune to 1400KC signal. | " | A6 | Adjust for maximum while rocking tuning gang. |

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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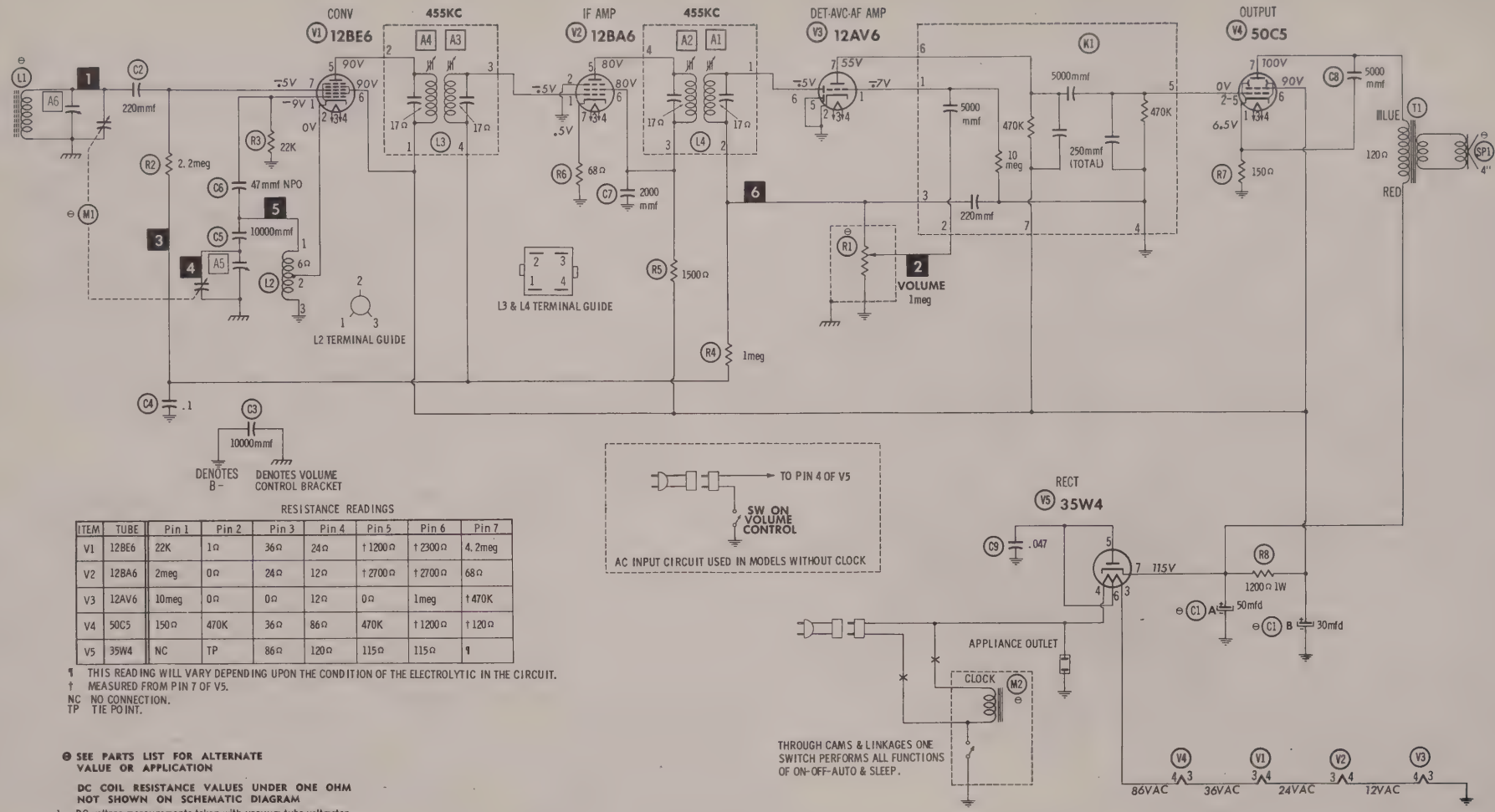
SET 476 FOLDER 3




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 12BE6 | 22K | 1Ω | 36Ω | 24Ω | †1200Ω | †2300Ω | 4.2meg |
| V2 | 12BA6 | 2meg | 0Ω | 24Ω | 12Ω | †2700Ω | †2700Ω | 68Ω |
| V3 | 12AV6 | 10meg | 0Ω | 0Ω | 12Ω | 0Ω | 1meg | †470K |
| V4 | 50C5 | 150Ω | 470K | 36Ω | 86Ω | 470K | †1200Ω | †120Ω |
| V5 | 35W4 | NC | TP | 86Ω | 120Ω | 115Ω | 115Ω | ¶ |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.
TP TIE POINT.

**⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION**

**DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM**

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

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**ADMIRAL CHASSIS 5A5, 5D5, 5L5**

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆ | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | Converter | 12BE6 | V4 | Output | 50C5 |
| V2 | IF Amplifier | 12BA6 | V5 | Rectifier | 35W4 |
| V3 | Det. - AVC - AF Amp. | 12AV6 | | | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | ADMIRAL PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | B 50 | 150 | 67C39-1 ① | PRS2200 | BBRD5315 | WD210 | TDLD-8 | TVA-2450 | |
| B | C 30 | 150 | | | | | | | |

① Part #67B39-1 used in Chassis 5A5, 5L5.

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C2 | 220 | | DI-220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C3 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C4 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C5 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C6 | 47 NPO | | NPO-DI 47 | DTZ-47 | C10Q47C | CCTO-470 | CNO-447 | 10TCC-Q47 |
| C7 | 2000 | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C8 | 5000 | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C9 | .047 400V | | P488N-047 | DD-503 | CUB4S47 | 4DP-3-473 | GEM-4147 | 4TM-S47 |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | ADMIRAL PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1 | 1meg | ½ | 75D56-3 | | | | | Volume Note 1 |

Note 1. Chassis 5A5 uses Part #75D56-1 (With Switch).
Chassis 5L5 uses Part #75D56-4 (With Switch).

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R2 | 2.2meg | |
| R3 | 22K | |
| R4 | 1meg | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R5 | 1500Ω | |
| R6 | 68Ω | |
| R7 | 150Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R8 | 1200Ω 1W | |

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | ADMIRAL PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Loopstick | 69B228-3 † | | | | | | |
| L2 | Osc. Coil | 69A217-1 | | | | | | |
| L3 | Input IF | 72C170-5 | 16-6780 | 16-6780 | BC-356 | 13-PC1 | RF-4 | |
| L4 | Output IF | 72C170-4 | 16-6780 | 16-6780 | BC-357 | 13-PC2 | RF-4 | |

† Chassis 5L5 uses Part #69C240-1 in this application.

# PRINTED BOARD

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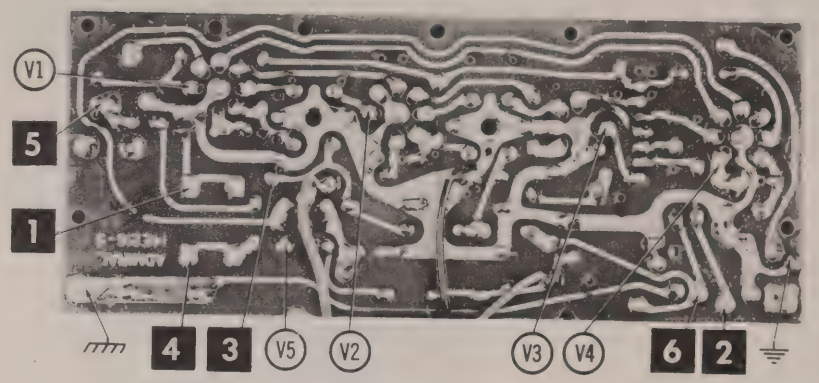
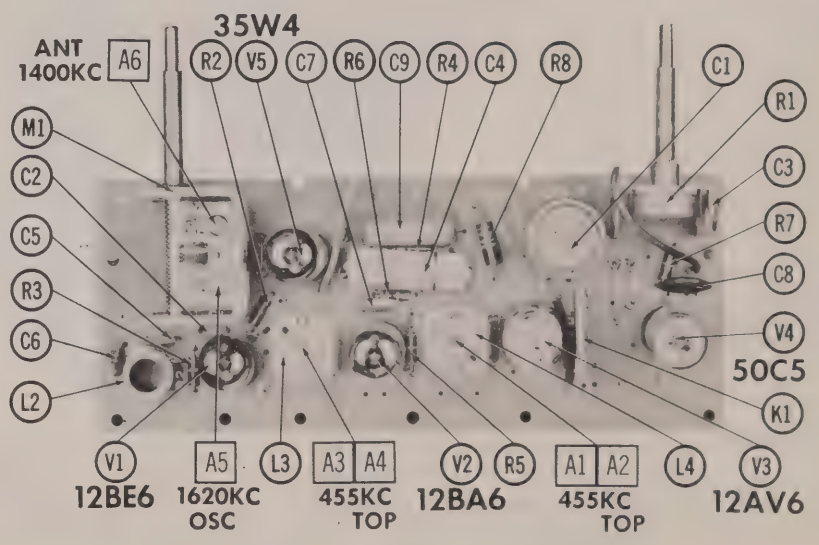
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED




# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | ADMIRAL PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2100Ω | 3-4Ω | (Part of SP1) | 24S53 | A-3025 | AU-605 | A-3332 | 24S53 | S-12X | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | ADMIRAL PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3-4Ω | 78B142-1② | | |
| | 4" | PM | 3-4Ω | 78B94-2① | | |

① Includes T1. Models Y873, Y875, Y878
② Includes T1. Models Y833, Y837, Y838, Y839, Y846, Y847, Y848, Y849.

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | ADMIRAL PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K1 | Audio-Detector Coupling | 220mmf, 250mmf, (2) 5000mmf, (2) 470K, 10meg | 63C6-20 | Aerovox PA-306<br>Centralab PC-159<br>Sprague DT-6 |

## MISCELLANEOUS

| ITEM No. | PART NAME | ADMIRAL PART No. | NOTES |
|---|---|---|---|
| M1 | Tuning Cap. | 68C76-3 | 2 Gang, Chassis 5D5 (Ant. 272mmf Max., Osc. 102mmf Max.) |
| | Tuning Cap. | 68C76-1 | 2 Gang, Chassis 5A5 |
| | Tuning Cap | 68C76-2 | 2 Gang, Chassis 5L5 |
| M2 | Clock | 91C40-1 | Less Face, Time Set Shaft & Knobs. Chassis 5D5 |

## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 33C353-3 | Tuning, Models Y846, Y847, Y848, Y849 |
| Knob | 33C350-1 | Tuning, Models Y833, Y837, Y838, Y839 |
| Knob | 21C127-1 | Tuning Disc, Models Y873, Y875, Y878 |
| Knob | 33B364-1 | Tuning & Volume, Models, Y873, Y875, Y878 |
| Knob | 33C353-1 | Volume, Models Y846, Y847, Y848, Y849 |
| Knob | 33C350-2 | Volume, Models Y833, Y837, Y838, Y839 |
| Knob | 21C127-2 | Volume Disc, Models Y873, Y875, Y878 |
| Knob | 33B368-1 | Snooze Alarm, Models Y873, Y875, Y878 |
| Knob | 33B365-1 | Clock, Y873, Y875, Y878 |
| Cabinet | 34E147-1 | Model Y833 |
| Cabinet | 34E147-2 | Model Y837 |
| Cabinet | 34E147-3 | Model Y838 |
| Cabinet | 34E147-4 | Model Y839 |
| Cabinet | 34D129-26 | Model Y846 |
| Cabinet | 34D129-28 | Model Y847 |
| Cabinet | 34D129-27 | Model Y848 |
| Cabinet | 34D129-25 | Model Y849 |
| Cabinet | 34D125-25 | Model Y873 |
| Cabinet | 34D125-26 | Model Y875 |
| Cabinet | 34D125-27 | Model Y878 |
| Cabinet Front | 34D150-1 | Model Y873, Y875, Y878 |

## CABINETS & CABINET PARTS (cont)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Cabinet Front | 34D148-2 | Model Y833, Y837, Y838, Y839, Y846, Y847, Y848 |
| Cabinet Front | 34D148-1 | Model Y849 |
| Clock Face | 23C368-1 | Models Y873, Y875, Y878 |
| Clock Crystal | 24C33-1 | Models Y873, Y875, Y878 |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type) ..... Use BELDEN No. 8874

## DISASSEMBLY INSTRUCTIONS

MODELS Y833, Y837, Y838, Y839

1. Remove tuning and volume knobs. Remove tuning knob trim plate.
2. Remove cabinet back.
3. Remove 2 chassis mounting screws, one from under tuning trim plate, the other from cabinet rear.
4. Remove chassis.

MODELS Y846, Y847, Y848, Y849, Y873, Y875, Y878

1. Remove 2 screws from cabinet bottom.
2. Loosen 2 screws from cabinet back.
3. Press on loosened screws to disconnect AC INTERLOCK.
4. Remove loosened screws.
5. Pull cabinet front, with chassis attached, from cabinet.

CLOCK REMOVAL

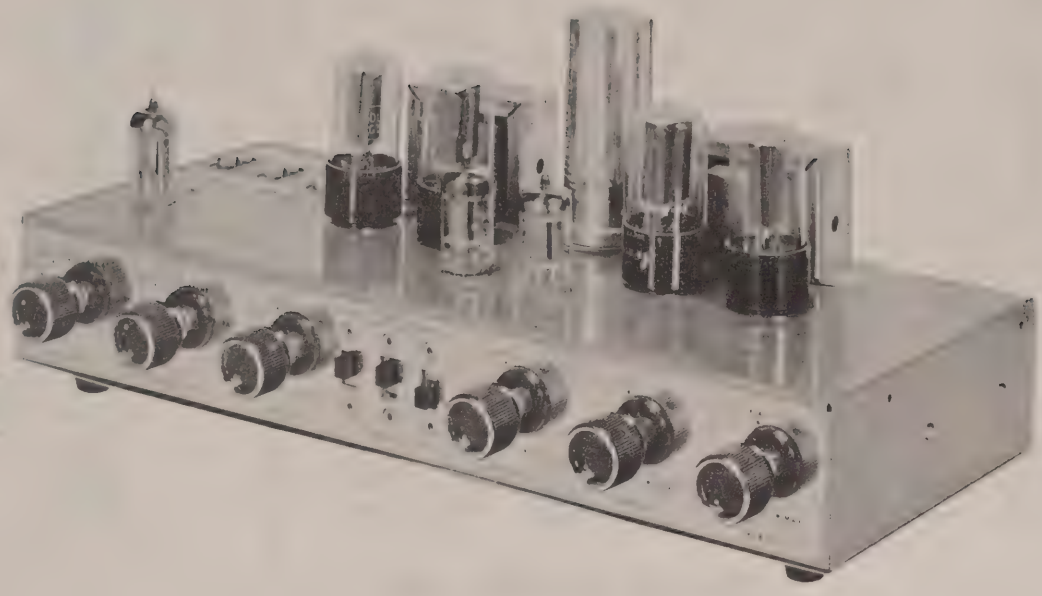
1. Remove cabinet front, with chassis attached, from cabinet (See Disassembly).
2. Remove knobs and screws holding chassis and brackets to cabinet front.
3. Remove clock crystal. (Press down on 3 top tabs and up on 3 bottom tabs.)
4. Remove metal discs under radio knobs.
5. Remove screw from volume control bracket.
6. Remove screw from frame of tuning gang.
7. Remove black background insert.
8. Remove 2 clock mounting nuts. Remove 4 clock face tabs.
9. Remove clock from front. (Lift bottom out first.)

PHOTOFACT® Folder

EIA MEMBER

# ARKAY
# MODEL CS-12

ARKAY
MODEL CS-12



ARKAY
MODEL CS-12

| | | | |
|---|---|---|---|
| TRADE NAME | Arkay Model CS-12 | | |
| MANUFACTURER | Arkay International, Inc., 88-06 VanWyck Expressway, Jamaica 18, N. Y. | | |
| TYPE SET | AC Operated 7 Tube Stereo Amplifier | | |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles | RATING | 100 Watts, .96 Amp. @ 117 Volts AC |

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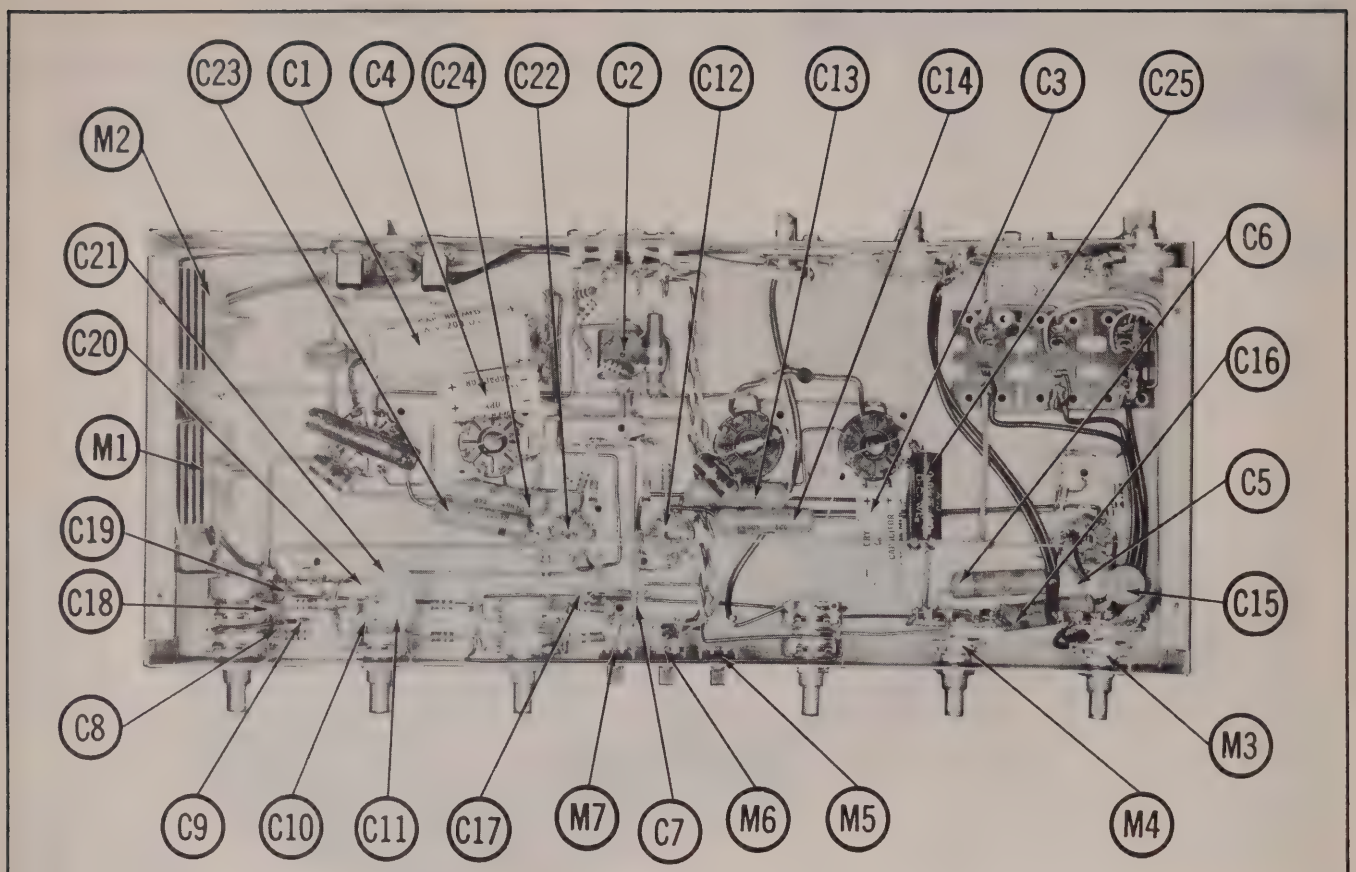
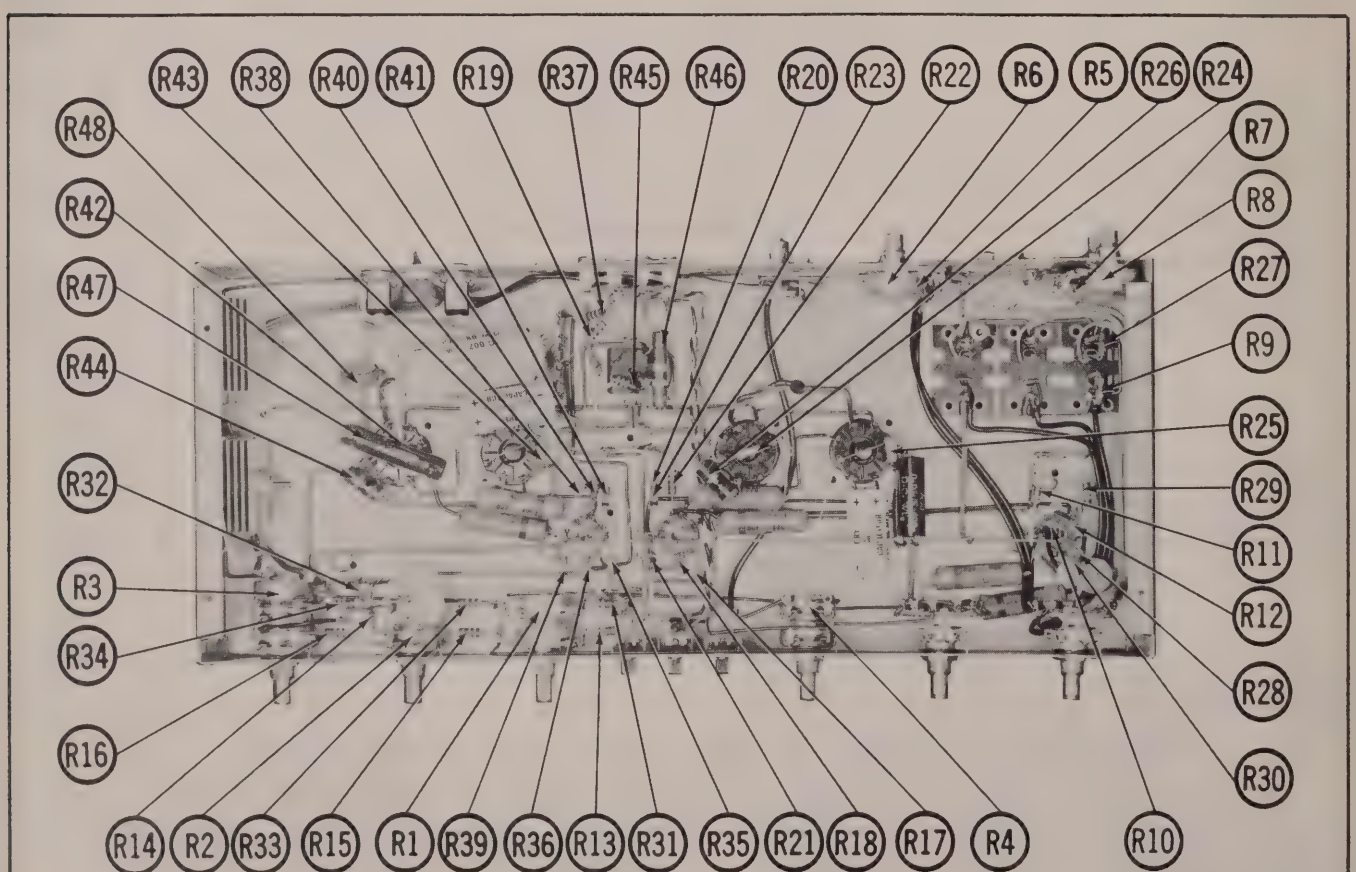



CHASSIS BOTTOM VIEW




CHASSIS BOTTOM VIEW

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
|---|---|---|---|---|---|
| V1 | Left Channel Preamp. - Right Channel Preamp. | ECC83/12AX7 | V4 | Left Channel Output | 50L6GT |
| V2 | Left Channel AF Amp. - Phase Inverter | ECC83/12AX7 | V5 | Right Channel AF Amp. - Phase Inverter | ECC83/12AX7 |
| V3 | Left Channel Output | 50L6GT | V6 | Right Channel Output | 50L6GT |
| | | | V7 | Right Channel Output | 50L6GT |

CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA ARKAY PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1 | 80 | 200 | | PRS1780 | BR8035 | TC80 | TD-80-350 | TVA-1716 | |
| C2A | ■40 | 450 | | AFH3-44 | C0350 | FP377 | TMT-40 | TVL-3787 | |
| B | ▲40 | 450 | | | | | | | |
| C | ▲40 | 450 | | | | | | | |
| C3 | 25 | 25 | | PRS1260 | BBR25-25 | TC26 | TD-25-25 | TVA-1205 | |
| C4 | 25 | 25 | | PRS1260 | BBR25-25 | TC26 | TD-25-25 | TVA-1205 | |

## FIXED CAPACITORS

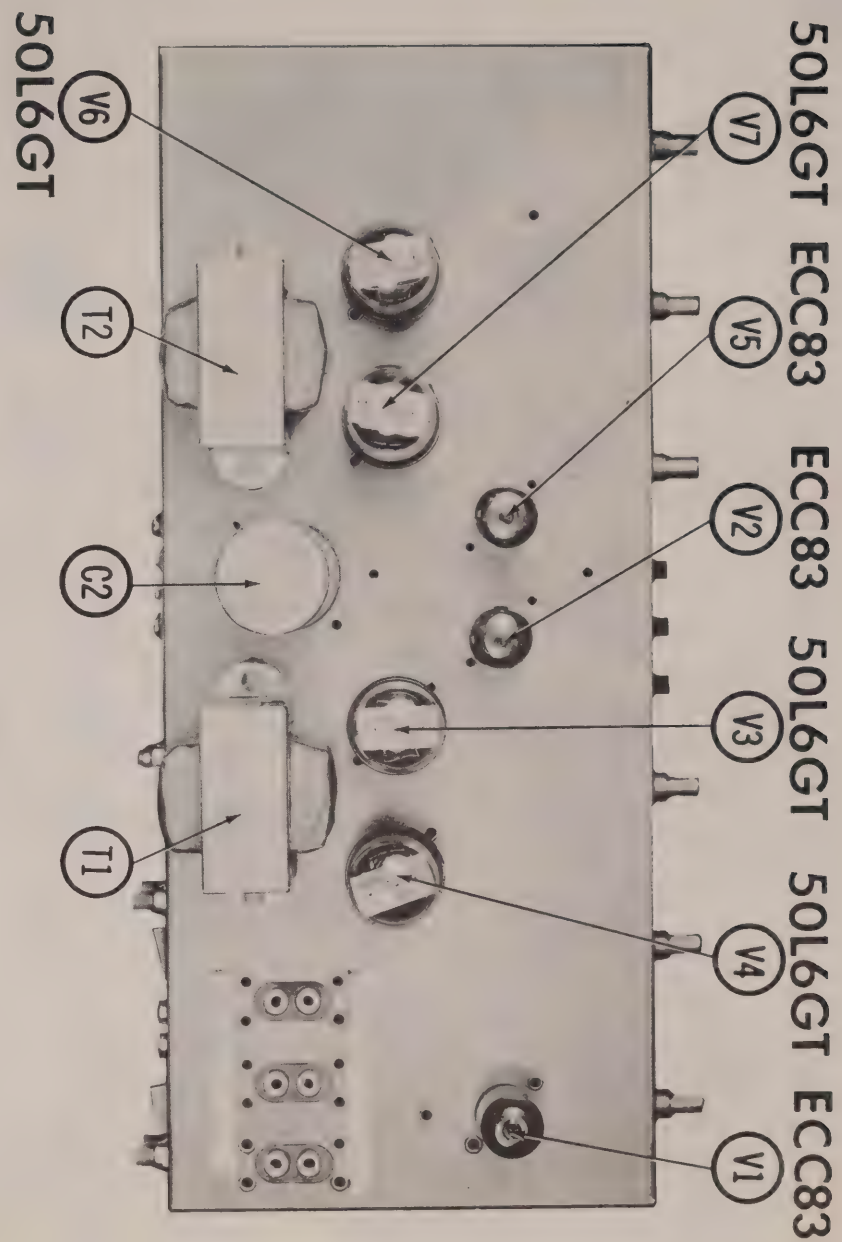
**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C5 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C6 | .022 400V | | P488N-022 | DD-203 | CUB4S22 | 4DP-2-233 | GEM-4122 | 4TM-S22 |
| C7 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C8 | 270 10% | | DI-270 | DD-271 | L10T27 | CCD-271 | GP327 | 10TS-T27 |
| C9 | 2000 | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C10 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C11 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C12 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C13 | .022 400V | | P488N-022 | DD-203 | CUB4S22 | 4DP-2-223 | GEM-4122 | 4TM-S22 |
| C14 | .022 400V | | P488N-022 | DD-203 | CUB4S22 | 4DP-2-223 | GEM-4122 | 4TM-S22 |
| C15 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C16 | .022 400V | | P488N-022 | DD-203 | CUB4S22 | 4DP-2-223 | GEM-4122 | 4TM-S22 |
| C17 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C18 | 270 10% | | DI-270 | DD-271 | L10T27 | CCD-271 | GP327 | 10TS T27 |
| C19 | 2000 | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C20 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C21 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C22 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C23 | .022 400V | | P488N-022 | DD-203 | CUB4S22 | 4DP-2-223 | GEM-4122 | 4TM-S22 |
| C24 | .022 400V | | P488N-022 | DD-203 | CUB4S22 | 4DP-2-223 | GEM-4122 | 4TM-S22 |
| C25 | .05 400V | | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA ARKAY PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 250K | 1/2 | BA819-007 | | | | | Loudness, Left Channel |
| | 75K Tap | | | | | | | |
| B | 250K | 1/2 | | | | | | Loudness, Right Channel |
| | 75K Tap | | | | | | | |
| R2A | 2meg | 1/2 | BA817-101 | B-76 | AD47-2meg-Z | Q13-139 | | Bass, Left Channel |
| B | 2meg | 1/2 | | SR-76 | Not Req. | M13-139 | ■ UE1874 | Bass, Right Channel |
| C | Shaft | | | Not Req. | RS-2 | Not Req. | | |
| R3A | 2meg | 1/2 | BA818-027 | B-76 | AD47-2meg-Z | Q13-139 | | Treble, Left Channel |
| B | 2meg | 1/2 | | SR-76 | Not Req. | M13-139 | ▲ UE1873-S | Treble, Right Channel |
| C | Shaft | | | Not Req. | RS-2 | Not Req. | | |
| D | Switch | | | KR-1 | SWE-12 | 76-1 | | |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## CONTROLS (cont)

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | ARKAY PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R4A | 500K | ½ | BA817-100 | B-59 | AD47-500K-S | Q11-133 | ▲ UE1295 | Balance, Left Channel |
| B | 500K | ½ | | SR-59 | Not Req. | M11-133 | | Balance, Right Channel |
| C | Shaft | | | Not Req. | RS-2 | Not Req. | | |
| R5A | 1meg | ½ | FM8-2 | BX-69 | B47-1meg-S | B11-137 | SU-54 | Aux. 1 Level, Left Channel |
| B | Shaft | | | Not Req. | Not Req. | SK6 | Not Req. | |
| R6A | 1meg | ½ | FM8-2 | BX-69 | B47-1meg-S | B11-137 | SU-54 | Tuner Level, Left Channel |
| B | Shaft | | | Not Req. | Not Req. | SK6 | Not Req. | |
| R7A | 1meg | ½ | FM8-2 | BX-69 | B47-1meg-S | B11-137 | SU-54 | Aux. 1 Level, Right Channel |
| B | Shaft | | | Not Req. | Not Req. | SK6 | Not Req. | |
| R8A | 1meg | ½ | FM8-2 | BX-69 | B47-1meg-S | B11-137 | SU-54 | Tuner Level, Right Channel |
| B | Shaft | | | Not Req. | Not Req. | SK6 | Not Req. | |

■ "STA-LOC" Equivalent: FA26A, RU26A, CS3500.
▲ "STA-LOC" Equivalent: FA26A, RU26A, CS3500, US41.
▲ "STA-LOC" Equivalent: FA55L, RU55L, CS3500.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | ARKAY PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 4600Ω CT | 16Ω Taps② 8Ω, 4Ω | | 24S14 | A-2901① | AU-609 | A-3870 | 24S14 | S-55X | ① Drill new mounting hole. |
| T2 | 4600Ω CT | 16Ω Taps② 8Ω, 4Ω | | 24S14 | A-2901① | AU-609 | A-3870 | 24S14 | S-55X | |

## RECTIFIERS

| ITEM No. | RATING | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | CURRENT (Measured) | ARKAY PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | | |
| M1 | .094A | ① | T200 ① | 1236AH ① | 200 ① | SR200 ① | | ① Selenium Type |
| M2 | .094A | ① | T200 ① | 1236AH ① | 200 ① | SR200 ② | | ② Silicon Type |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R9 | 4.7meg | |
| R10 | 1meg | |
| R11 | 100K | |
| R12 | 1500Ω | |
| R13 | 15K | |
| R14 | 220K | |
| R15 | 27K | |
| R16 | 27K | |
| R17 | 220K | |
| R18 | 2200Ω | |
| R19 | 47K | |
| R20 | 1meg | |
| R21 | 100K | |
| R22 | 2200Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R23 | 100K | |
| R24 | 470K | |
| R25 | 470K | |
| R26 | 75Ω 5% 2W | |
| R27 | 4.7meg | |
| R28 | 1meg | |
| R29 | 100K | |
| R30 | 1500Ω | |
| R31 | 15K | |
| R32 | 220K | |
| R33 | 27K | |
| R34 | 27K | |
| R35 | 220K | |
| R36 | 2200Ω | |

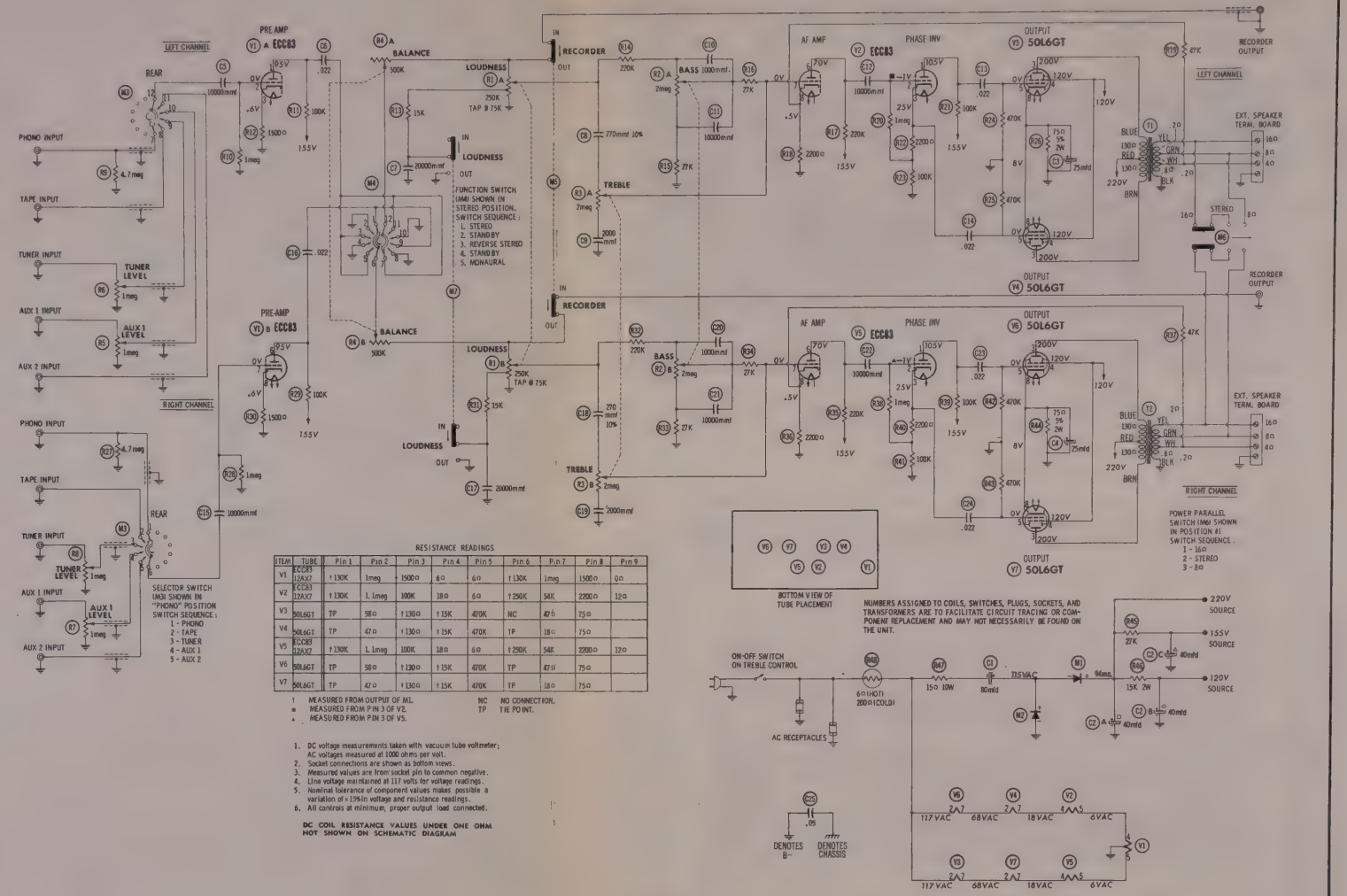
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R37 | 47K | |
| R38 | 1meg | |
| R39 | 100K | |
| R40 | 2200Ω | |
| R41 | 100K | |
| R42 | 470K | |
| R43 | 470K | |
| R44 | 75Ω 5% 2W | |
| R45 | 27K | |
| R46 | 15K 2W | |
| R47 | 15Ω 10W | |
| R48 | 200Ω Cold | |

## MISCELLANEOUS

| ITEM No. | PART NAME | ARKAY PART No. | NOTES |
|---|---|---|---|
| M3 | Switch | | Selector |
| M4 | Switch | | Function |
| M5 | Switch | | Recorder (DPST, Slide Type) |
| M6 | Switch | | Power Parallel (TPTT, Slide Type) |
| M7 | Switch | | Loudness (DPST, Slide Type) |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)


LEFT CHANNEL
RIGHT CHANNEL
PRE AMP
V1 A ECC83
V1 B ECC83
REAR
PHONO INPUT
TAPE INPUT
TUNER INPUT
AUX 1 INPUT
AUX 2 INPUT
TUNER LEVEL
AUX 1 LEVEL
BALANCE
LOUDNESS
TREBLE
BASS
RECORDER
FUNCTION SWITCH (M4) SHOWN IN STEREO POSITION. SWITCH SEQUENCE: 1. STEREO 2. STANDBY 3. REVERSE STEREO 4. STANDBY 5. MONAURAL
SELECTOR SWITCH (M3) SHOWN IN "PHONO" POSITION SWITCH SEQUENCE: 1 - PHONO 2 - TAPE 3 - TUNER 4 - AUX 1 5 - AUX 2
AF AMP
PHASE INV
OUTPUT
V2 ECC83
V3 50L6GT
V4 50L6GT
V5 ECC83
V6 50L6GT
V7 50L6GT
RECORDER OUTPUT
EXT. SPEAKER TERM. BOARD
STEREO
POWER PARALLEL SWITCH (M6) SHOWN IN POSITION #1 SWITCH SEQUENCE: 1 - 16Ω 2 - STEREO 3 - 8Ω
BOTTOM VIEW OF TUBE PLACEMENT
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
ON-OFF SWITCH ON TREBLE CONTROL
AC RECEPTACLES
220V SOURCE
155V SOURCE
120V SOURCE
DENOTES B-
DENOTES CHASSIS

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | ECC83 12AX7 | ↑130K | 1meg | 1500Ω | 6Ω | 6Ω | ↑130K | 1meg | 1500Ω | 0Ω |
| V2 | ECC83 12AX7 | ↑130K | 1.1meg | 100K | 1Ω | 6Ω | ↑250K | 54K | 2200Ω | 12Ω |
| V3 | 50L6GT | TP | 58Ω | ↑130Ω | ↑15K | 470K | NC | 47Ω | 75Ω | |
| V4 | 50L6GT | TP | 47Ω | ↑130Ω | ↑15K | 470K | TP | 18Ω | 75Ω | |
| V5 | ECC83 12AX7 | ↑130K | 1.1meg | 100K | 1Ω | 6Ω | ↑250K | 54K | 2200Ω | 12Ω |
| V6 | 50L6GT | TP | 58Ω | ↑130Ω | ↑15K | 470K | TP | 47Ω | 75Ω | |
| V7 | 50L6GT | TP | 47Ω | ↑130Ω | ↑15K | 470K | TP | 18Ω | 75Ω | |

1 MEASURED FROM OUTPUT OF M1.
■ MEASURED FROM PIN 3 OF V2.
▲ MEASURED FROM PIN 3 OF V5.

NC NO CONNECTION.
TP TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

**DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM**

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1960

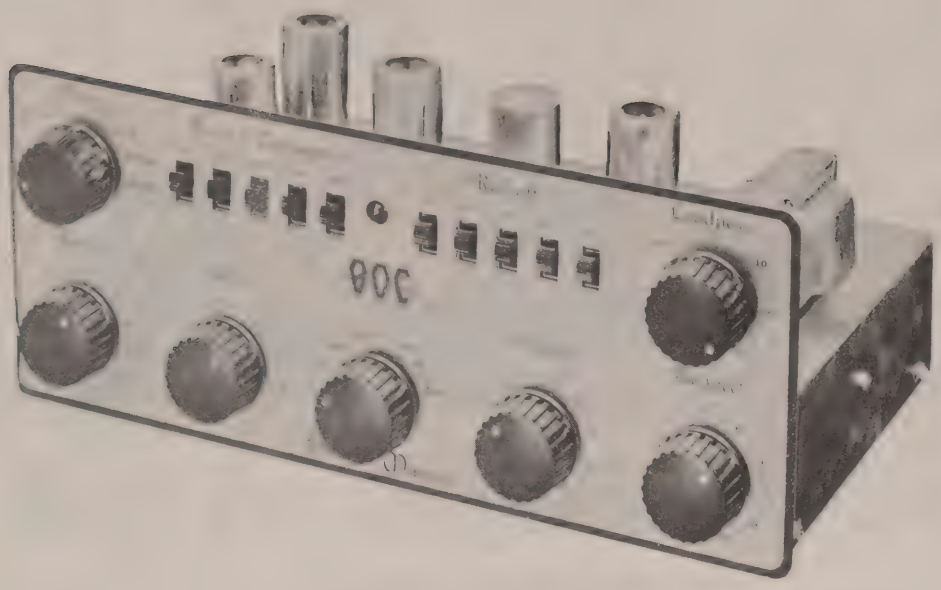
**ARKAY MODEL CS-12**

PHOTOFACT® Folder

EIA MEMBER

# BIGG OF CALIFORNIA
# MODEL P-3-D

BIGG OF CALIFORNIA
MODEL P-3-D



BIGG OF CALIFORNIA
MODEL P-3-D

| | |
|---|---|
| TRADE NAME | Bigg Model P-3-D |
| MANUFACTURER | Bigg of California, 2506 W. Washington Blvd., Los Angeles 18, California |
| TYPE SET | AC Operated 4 Tube Stereo Amplifier |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 11 Watts, .1 Amp. @117 Volts AC |

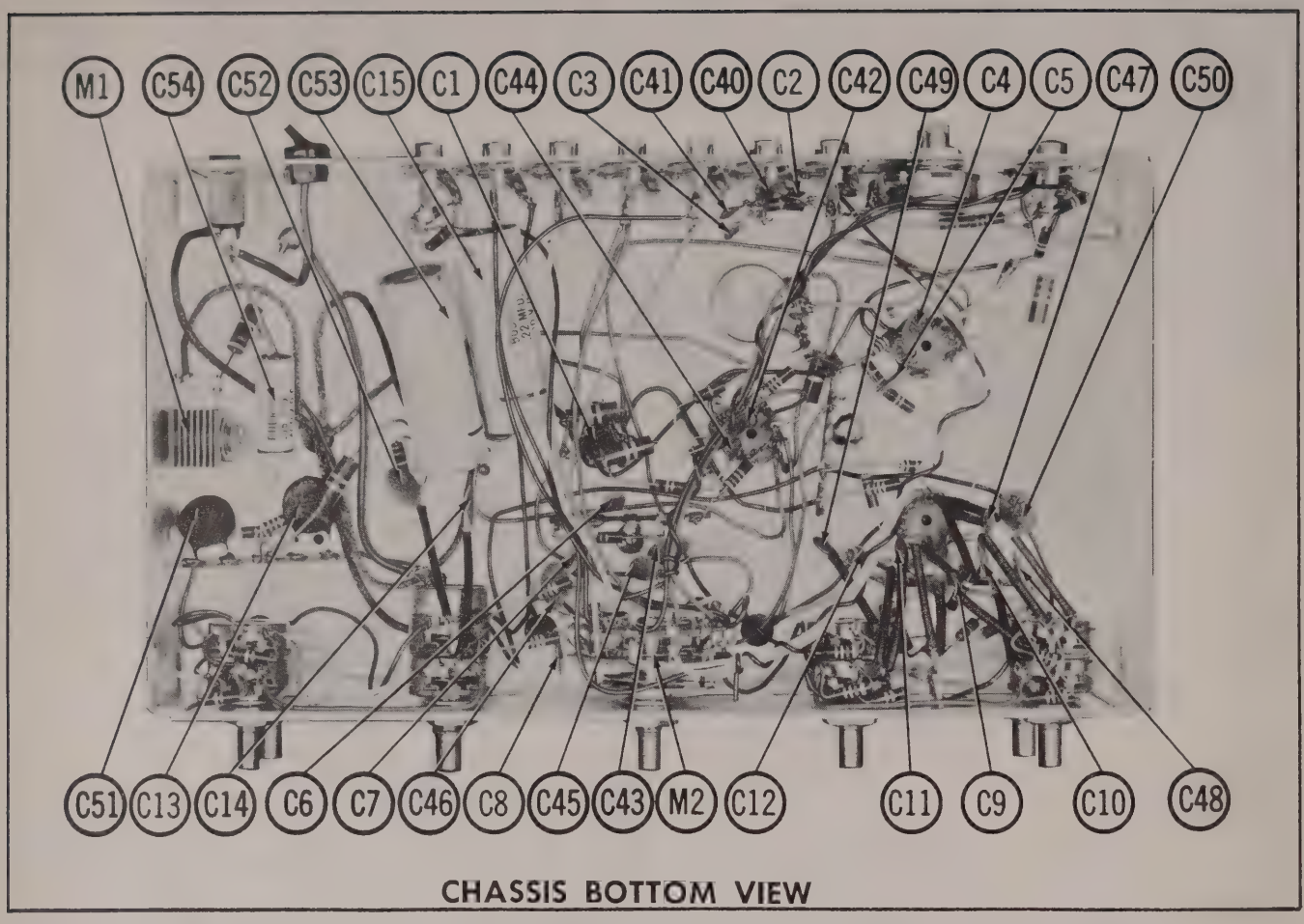
**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

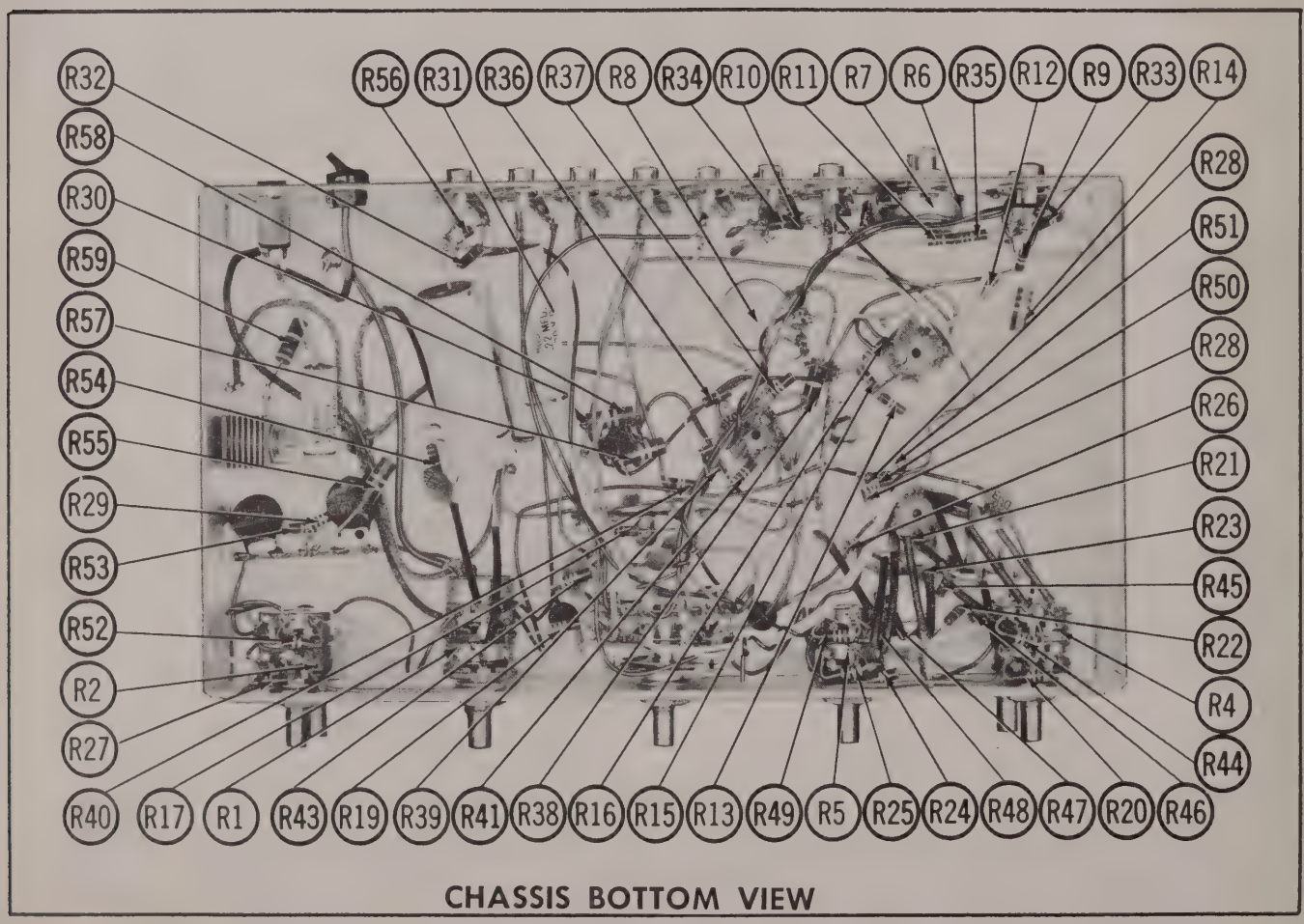
JU614



SET 476 FOLDER 5




CHASSIS BOTTOM VIEW




CHASSIS BOTTOM VIEW

# PARTS LIST AND DESCRIPTIONS

## TUBES

| • CBS • | | GENERAL ELECTRIC • | | • RAYTHEON • | | • SYLVANIA • | |
|---|---|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | | ITEM No. | USE | TYPE |
| V1 | Left Channel Preamp. | ECC83 | | V3 | Left Channel Cathode Foll. – Right Channel Cathode Foll. | ECC83 |
| V2 | Left Channel AF Amp. – Right Channel AF Amp. | ECC83 | | V4 | Right Channel Preamp. | ECC83 |

## ELECTROLYTIC CAPACITORS

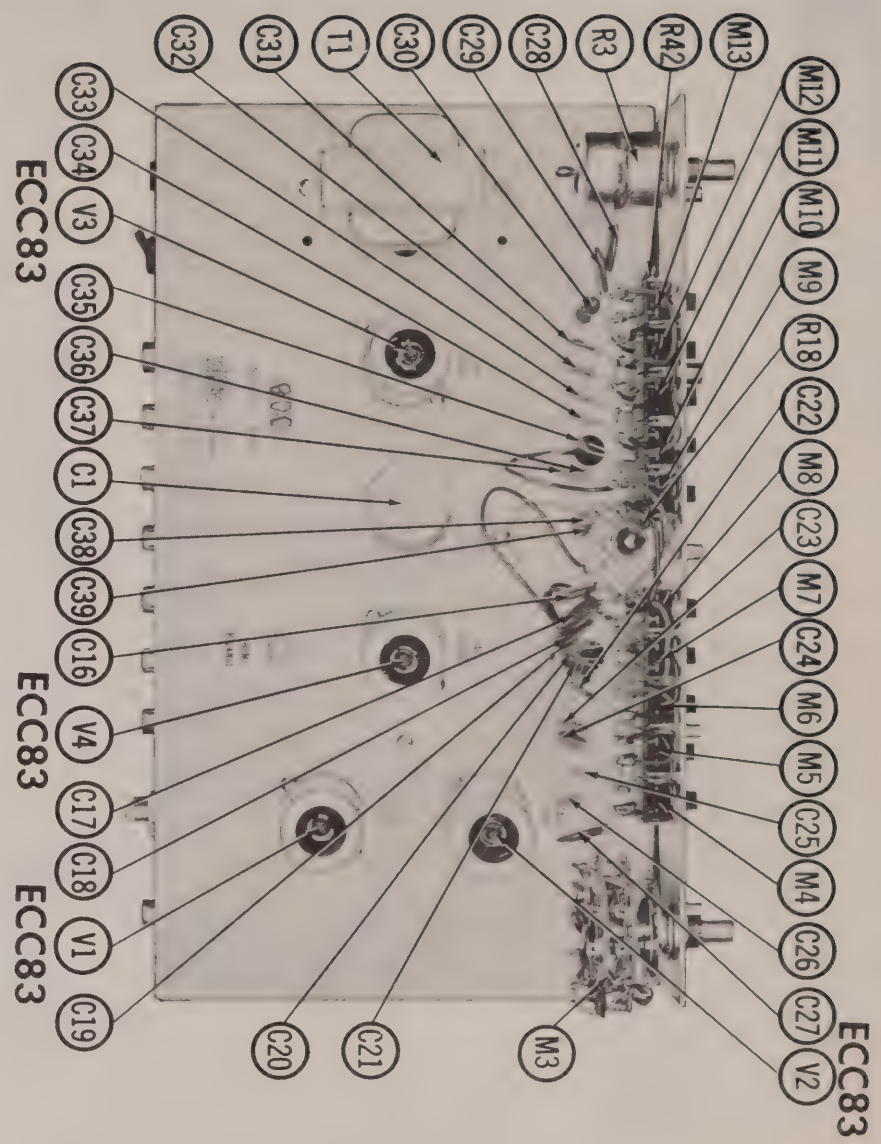
| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | BIGG PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | ▲10 | 150 | | AFH3-35 | XC0041 | FP376.3 | TMT-4 | TVL-3433 | |
| B | ■20 | 150 | | | | | | | |
| C | 10 | 150 | | | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C2 | 47 10% | Note 1 | DI-47 | DD-470 | L10Q47 | CCD-470 | GP447 | 10TS-Q47 |
| C3 | 47 10% | | DI-47 | DD-470 | L10Q47 | CCD-470 | GP447 | 10TS-Q47 |
| C4 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C5 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C6 | 100 | | BPD-0001 | DD-101 | L10T1 | CCD-101 | GP310 | 10TS-T10 |
| C7 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C8 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C9 | 100 | | BPD-0001 | DD-101 | L10T1 | CCD-101 | GP310 | 10TS-T10 |
| C10 | 40000 10% | | | | PM6S4 | 6DP-3-403 | GEM-1614 | 6TM-S4 |
| C11 | 2000 | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C12 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C13 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C14 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C15 | .22 600V | | P688N-22 | | CUB6P22 | 6DP-5-224 | GEM-6022 | 6TM-P22 |
| C16 | 1500 | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | GP215 | 5HK-D15 |
| C17 | 1500 | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | GP215 | 5HK-D15 |
| C18 | 1500 | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | GP215 | 5HK-D15 |
| C19 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C20 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C21 | 750 10% | | DI-750 | DD-751 | 1R5T75 | CCD-751 | GP375 | 10TS-T75 |
| C22 | 750 10% | | DI-750 | DD-751 | 1R5T75 | CCD-751 | GP375 | 10TS-T75 |
| C23 | 470 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C24 | 470 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C25 | 330 | | DI-330 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C26 | 330 | | DI-330 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C27 | 1500 | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | GP215 | 5HK-D15 |
| C28 | 1500 | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | GP215 | 5HK-D15 |
| C29 | 1500 | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | GP215 | 5HK-D15 |
| C30 | 750 10% | | DI-750 | DD-751 | 1R5T75 | CCD-751 | GP375 | 10TS-T75 |
| C31 | 750 10% | | DI-750 | DD-751 | 1R5T75 | CCD-751 | GP375 | 10TS-T75 |
| C32 | 470 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C33 | 470 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C34 | 330 | | DI-330 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C35 | 330 | | DI-330 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C36 | 220 | | DI-220 | DD-221 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C37 | 220 | | DI-220 | DD-220 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C38 | 220 | | DI-220 | DD-220 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C39 | 220 | | DI-220 | DD-220 | L10T22 | CCD-221 | GP322 | 10TS-T22 |
| C40 | 47 10% | Note 1 | DI-47 | DD-47 | L10Q47 | CCD-470 | GP447 | 10TS-Q47 |
| C41 | 47 10% | | DI-47 | DD-47 | L10Q47 | CCD-470 | GP447 | 10TS-Q47 |
| C42 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C43 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C44 | 100 | | BPD-0001 | DD-101 | L10T1 | CCD-101 | GP310 | 10TS-T10 |
| C45 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | GP210 | 5HK-D10 |
| C46 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C47 | 100 | | BPD-0001 | DD-101 | L10T1 | CCD-101 | GP310 | 10TS-T10 |
| C48 | 40000 10% | | | | PM6S4 | 6DP-3-403 | GEM-1614 | 6TM-S4 |
| C49 | 2000 | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C50 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C51 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## FIXED CAPACITORS (cont)

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C52 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C53 | .22 600V | | P688N-22 | | CUB6P22 | 6DP-5-224 | GEM-6022 | 6TM-P22 |
| C54 | .05 400V | Note 1 | P488N-05 | DD-503 | CUB4S5 | 4DP-3-503 | GEM-415 | 4TM-S5 |

Note 1. Not used in some versions.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | BIGG PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 1meg | ½ | CM22203 | AB-70 | AD47-1meg-Z | Q13-137 | ■ | Volume, Left Channel |
| B | 1meg | ½ | | SR-70 | Not Req. | M13-137 | ■ | Volume, Right Channel |
| C | Shaft | | | AK-9 | RS-2 | Not Req. | | |
| D | Switch | | | KR-1 | SWE-12 | 76-1 | | |
| R2A | 1meg | ½ | 31212 | AB-69 | AD47-1meg-S | Q11-137 | | Balance, Left Channel |
| B | 1meg | ½ | | SR-69 | Not Req. | M11-137 | ▲ UE1708 | Balance, Right Channel |
| C | Shaft | | | AK-9 | RS-2 | Not Req. | | |
| R3A | 1meg | ½ | CM21928 | AB-69 | AD47-1meg-S | Q11-137 | | Loudness, Left Channel |
| B | 1meg | ½ | | SR-69 | Not Req. | M11-137 | ▲ UE1708 | Loudness, Right Channel |
| C | Shaft | | | AK-9 | RS-2 | Not Req. | | |
| R4A | 1meg | ½ | 31212 | AB-69 | AD47-1meg-S | Q11-137 | | Treble, Left Channel |
| B | 1meg | ½ | | SR-69 | Not Req. | M11-137 | ▲ UE1708 | Treble, Right Channel |
| C | Shaft | | | AK-9 | RS-2 | Not Req. | | |
| R5A | 1meg | ½ | 31212 | AB-69 | AD47-1meg-S | Q11-137 | | Bass, Left Channel |
| B | 1meg | ½ | | SR-69 | Not Req. | M11-137 | ▲ UE1708 | Bass, Right Channel |
| C | Shaft | | | AK-9 | RS-2 | Not Req. | | |
| R6A | 100K | ½ | 4835 | AB-40 | A47-100K-S | Q11-128 | U41 | Phono Load, Left Channel |
| B | Shaft | | | AK-9 | FKS-1/4 | Not Req. | Not Req. | |
| R7A | 100K | ½ | 4835 | AB-40 | A47-100K-S | Q11-128 | U41 | Phono Load, Right Channel |
| B | Shaft | | | AK-9 | FKS-1/4 | Not Req. | Not Req. | |
| R8A | 3000Ω | ½ | CM17559 | AB-8 | A47-3000-S | Q11-112 | U8 | Hum Balance |
| B | Shaft | | | AK-1 | FKS-1/4 | Not Req. | Not Req. | |

■ "STA-LOC" equivalent: FA16A, RU16A, CS3500, US41.
▲ "STA-LOC" equivalent: FA16L, RU16L, CS3500.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R9 | 100K | |
| R10 | 1meg | |
| R11 | 560Ω | |
| R12 | 1meg | |
| R13 | 330K | |
| R14 | 680Ω 1W | |
| R15 | 3.3meg | |
| R16 | 100K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R17 | 47K | |
| R18 | 100K | |
| R19 | 470K | |
| R20 | 470K | |
| R21 | 470K | |
| R22 | 100K | |
| R23 | 220K | |
| R24 | 100K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R25 | 470K | |
| R26 | 330K | |
| R27 | 100K | |
| R28 | 3300Ω | |
| R29 | 33K | |
| R30 | 3.3meg | |
| R31 | 220K 1W | |
| R32 | 3.3meg | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R33 | 100K | |
| R34 | 1meg | |
| R35 | 560Ω | |
| R36 | 1meg | |
| R37 | 330K | |
| R38 | 680Ω 1W | |
| R39 | 3.3meg | |
| R40 | 100K | |
| R41 | 47K | |

* Alternate Value

## RESISTORS (cont)

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R42 | 100K | |
| R43 | 470K | |
| R44 | 470K | |
| R45 | 470K | |
| R46 | 100K | |
| R47 | 220K 1W | |
| R48 | 100K | |
| R49 | 470K | |
| R50 | 330K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R51 | 3300Ω | |
| R52 | 100K | |
| R53 | 33K | |
| R54 | 3.3meg | |
| R55 | 220K 1W | |
| R56 | 3.3meg | |
| R57 | 22K 1W | (33K) * |
| R58 | 22K 1W | |
| R59 | 47Ω 1W | |

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | BIGG PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 117V @ .1A | 110V @ .0015A | 6.3V @ 1.3A | PT-106 | 26R38 | | | | 26R38 | |

## RECTIFIERS

| ITEM No. | RATING | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CURRENT (Measured) | BIGG PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | |
| M1 | .0015A | | RS050 | 1234AH | Model 10 | SR200 | |

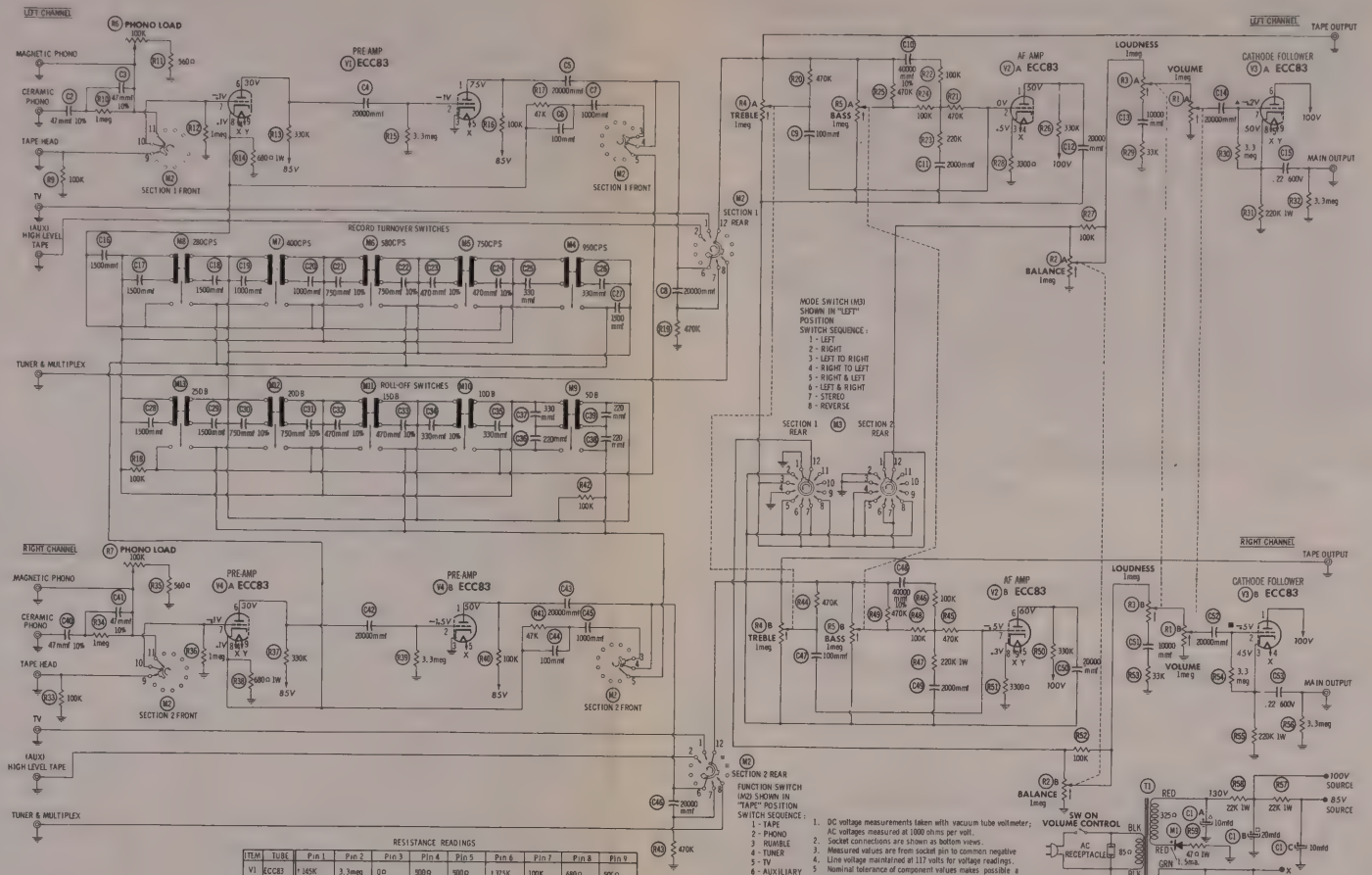
## MISCELLANEOUS

| ITEM No. | PART NAME | BIGG PART No. | NOTES |
|---|---|---|---|
| M2 | Switch | | Function (Rotary Wafer Type) |
| M3 | Switch | | Mode (Rotary Wafer Type) |
| M4 | Switch | | Record Turnover "950" (DPDT, Slide Type) |
| M5 | Switch | | Record Turnover "750" (DPDT, Slide Type) |
| M6 | Switch | | Record Turnover "580" (DPDT, Slide Type) |
| M7 | Switch | | Record Turnover "400" (DPDT, Slide Type) |
| M8 | Switch | | Record Turnover "280" (DPDT, Slide Type) |
| M9 | Switch | | Roll Off "5" (DPDT, Slide Type) |
| M10 | Switch | | Roll Off "10" (DPDT, Slide Type) |
| M11 | Switch | | Roll Off "15" (DPDT, Slide Type) |
| M12 | Switch | | Roll Off "20" (DPDT, Slide Type) |
| M13 | Switch | | Roll Off "25" (DPDT, Slide Type) |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | ECC83 | †.145K | 3.3meg | 0Ω | 500Ω | 500Ω | †.375K | 100K | 680Ω | 500Ω |
| V2 | ECC83 | †.350K | 650K | 3300Ω | 500Ω | 500Ω | †.350K | 650K | 3300Ω | 500Ω |
| V3 | ECC83 | †22K | 3.3meg | 220K | 500Ω | 500Ω | †22K | 3.3meg | 220K | 500Ω |
| V4 | ECC83 | †.145K | 3.3meg | 0Ω | 500Ω | 500Ω | †.375K | 100K | 680Ω | 500Ω |

† MEASURED FROM JUNCTION OF C1A AND R56.
* MEASURED FROM PIN 3 OF V3.
▲ MEASURED FROM PIN 8 OF V3.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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**BIGG OF CALIFORNIA**
**MODEL P-3-D**

PHOTOFACT® Folder

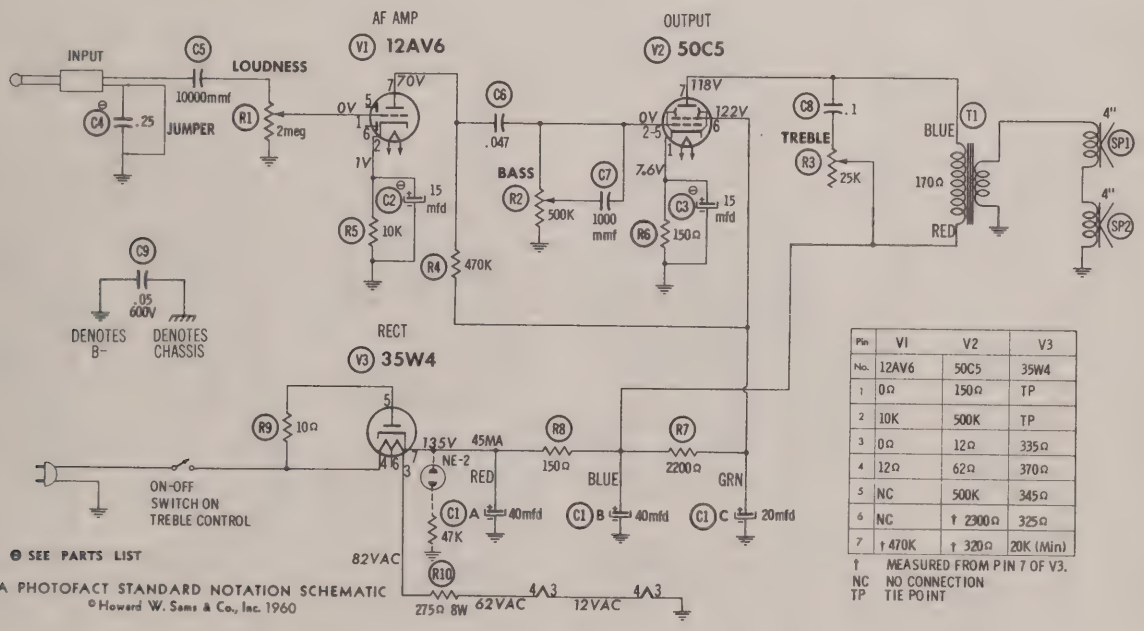
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

# FANFARE MODEL ST-4

FANFARE
MODEL ST-4

| | |
|---|---|
| TRADE NAME | Fanfare Model ST-4 |
| MANUFACTURER | Fanon Electronic Sales Corp., 919 Park Place, Brooklyn 13, N. Y. |
| TYPE SET | AC Operated 3 Tube Audio Amplifier |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 24 Watts, .27 Amp. @ 117 Volts AC |

FANFARE
MODEL ST-4




| Pin No. | V1 | V2 | V3 |
|---|---|---|---|
| 1 | 0Ω | 150Ω | TP |
| 2 | 10K | 500K | TP |
| 3 | 0Ω | 12Ω | 335Ω |
| 4 | 12Ω | 62Ω | 370Ω |
| 5 | NC | 500K | 345Ω |
| 6 | NC | † 2300Ω | 325Ω |
| 7 | † 470K | † 320Ω | 20K (Min) |

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SET 476 FOLDER 6

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ◆ CBS ◆ | | GENERAL ELECTRIC ◆ | | RAYTHEON ◆ | | SYLVANIA ◆ | |
|---|---|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE | | |
| V1<br>V2 | AF Amplifier<br>Output | 12AV6<br>50C5 | V3 | Rectifier | 35W4 | | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | FANFARE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | 40 | 150 | | PRS3650 | BBRT44215 | WT217 | TDLT-4 | TVA-3451 | |
| B | 40 | 150 | | | | | | | |
| C | 20 | 150 | | | | | | | |
| C2 | 15 | 12 | | XPP-12015 | NLW25X15 | TT25X15 | ML15-25 | TE-1129 | ① |
| C3 | 15 | 12 | | XPP-12015 | NLW25X15 | TT25X15 | ML15-25 | TE-1129 | ① |

① Some versions may use 10mfd in this application.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C4 | .25 400V | Note 1 | P488N-25 | | CUB4P25 | 4DP-5-254 | GEM-4025 | 4TM-P25 |
| C5 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C6 | .047 200V | | P288N-047 | DF-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C7 | 1000 | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | B-210 | 5HK-D10 |
| C8 | .1 200V | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |
| C9 | .05 600V | | P688N-05 | DF-503 | CUB6S5 | 6DP-3-503 | GEM-615 | 6TM-S5 |

Note 1. Jumper connected across C4 when AC phono is used.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | FANFARE PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 2meg | ½ | 52405 | B-76 | A47-2meg-Z | Q13-139 | U55 | Loudness |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R2A | 500K | ½ | 52508 | B-59 | A47-500K-S | Q11-133 | U50 | Bass |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| R3A | 25K | ½ | 52701 | B-25 | A47-25K-W | Q13-120 | U28A | Treble |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| C | Switch | | | KR-1 | SWE-12 | 76-1 | US-26 | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 470K | |
| R5 | 10K | |
| R6 | 150Ω | |

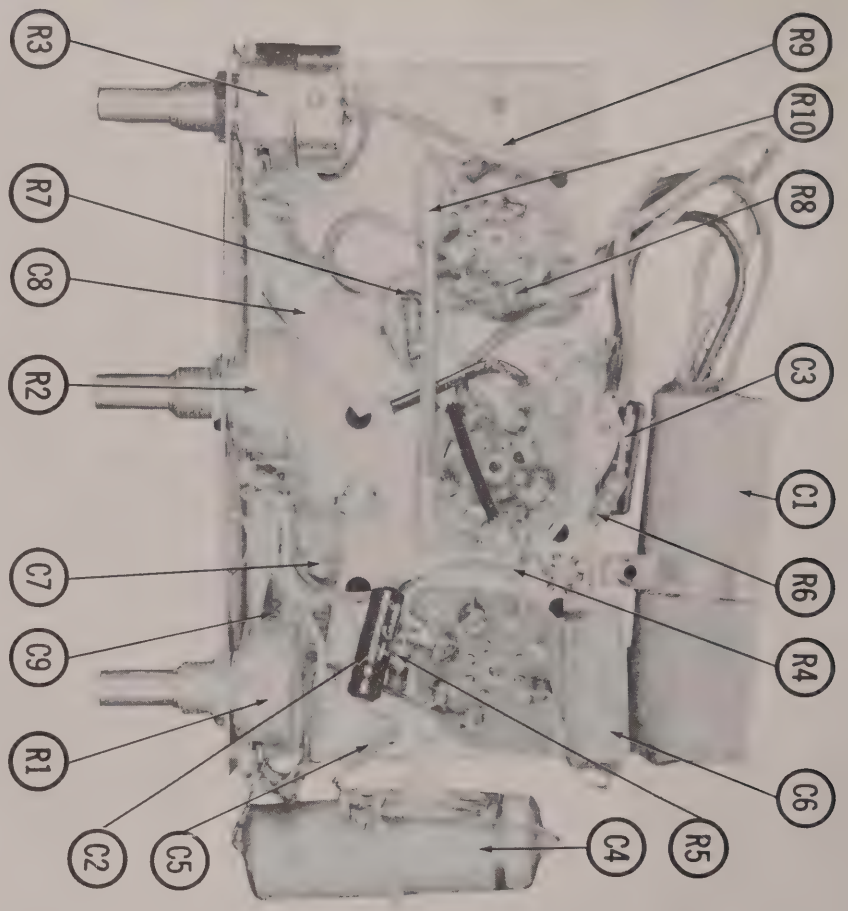
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R7 | 2200Ω | |
| R8 | 150Ω | |
| R9 | 10Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R10 | 275Ω 8W | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | FANFARE PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2400Ω | 3-4Ω | 0T59 | 24S53 | A-3025 | AU605 | A-3332 | 24S53 | S-12X | |

# CHASSIS BOTTOM VIEW




## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | FANFARE PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3-4Ω | 1025 | 4A1 | Parallel & Phase |
| SP2 | 4" | PM | 3-4Ω | 1025 | 4A1 | |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

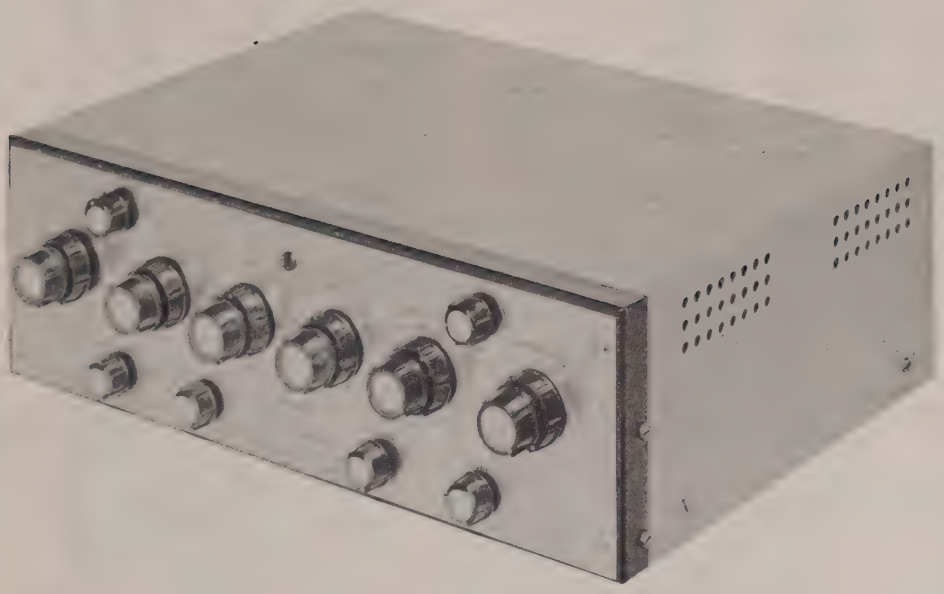
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

# LAFAYETTE MODELS KT-600, LT-600

LAFAYETTE MODELS
KT-600, LT-600



LAFAYETTE MODELS
KT-600, LT-600

| | |
|---|---|
| TRADE NAME | Lafayette Models KT-600, LA-600 |
| SUPPLIER | Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y. |
| TYPE SET | AC Operated 7 Tube Multi-Input Stereo Preamplifier |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 31 Watts, .35 Amp. @117 Volts AC |

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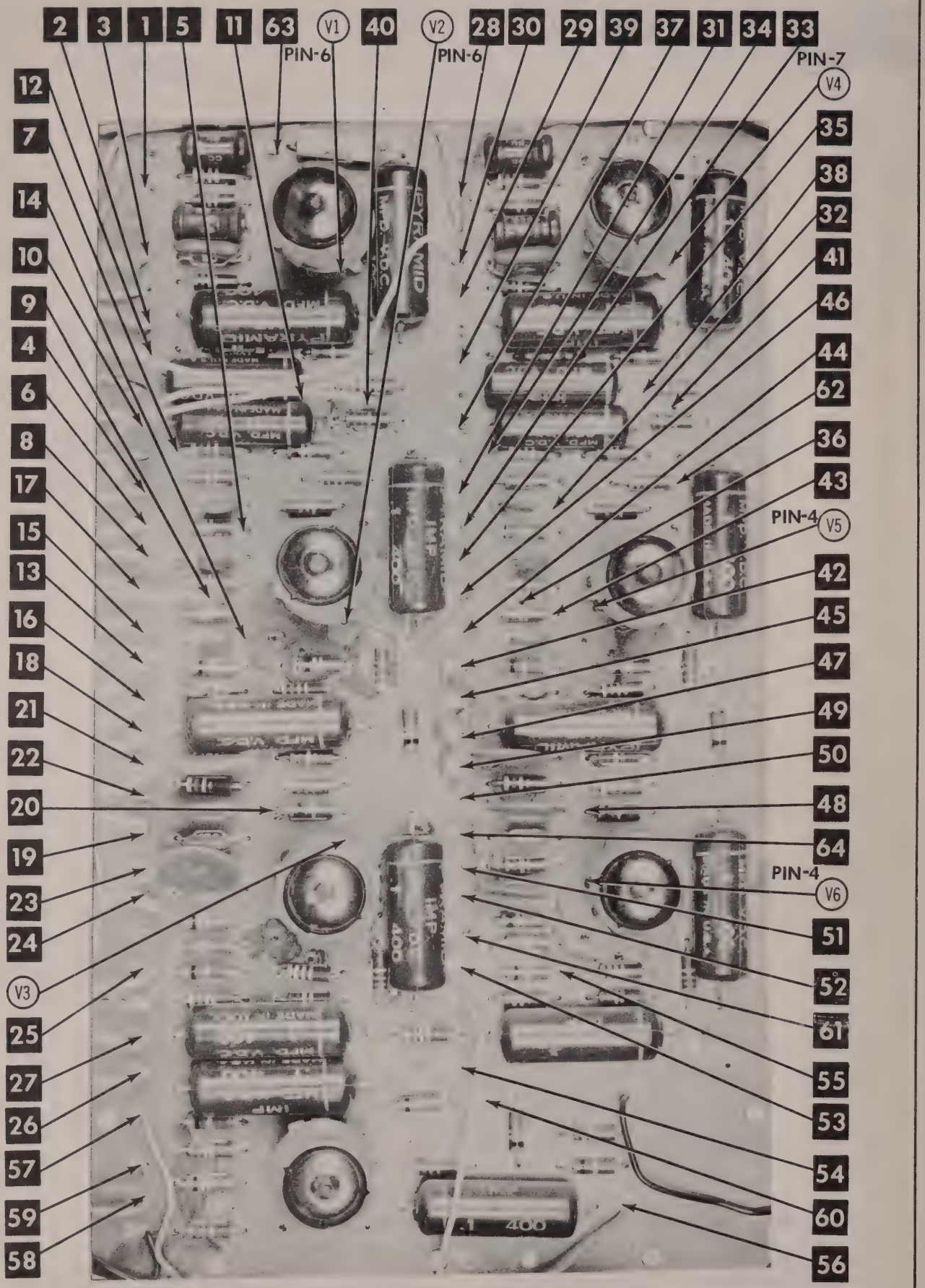
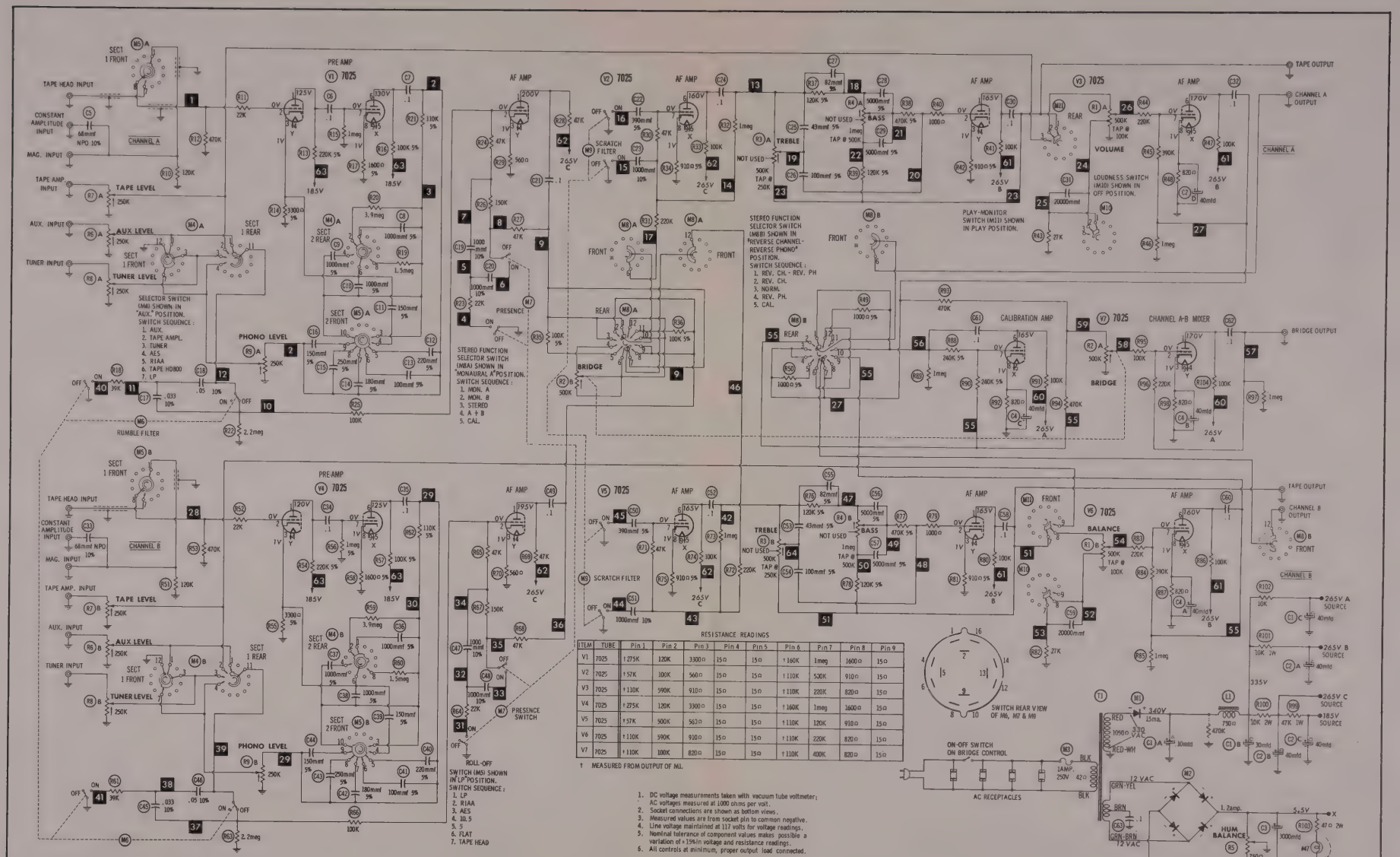



A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED


TAPE HEAD INPUT
CONSTANT AMPLITUDE INPUT
MAG. INPUT
TAPE AMP. INPUT
AUX. INPUT
TUNER INPUT
TAPE LEVEL
AUX LEVEL
TUNER LEVEL
PHONO LEVEL
SECT 1 FRONT
SECT 2 REAR
SECT 1 REAR
SECT 2 FRONT
PRE AMP
AF AMP
CHANNEL A
CHANNEL B
SELECTOR SWITCH (M4) SHOWN IN "AUX." POSITION. SWITCH SEQUENCE : 1. AUX. 2. TAPE AMPL. 3. TUNER 4. AES 5. RIAA 6. TAPE HD800 7. LP
RUMBLE FILTER
STEREO FUNCTION SELECTOR SWITCH (M8A) SHOWN IN "MONAURAL A" POSITION. SWITCH SEQUENCE : 1. MON. A 2. MON. B 3. STEREO 4. A + B 5. CAL.
PRESENCE
SCRATCH FILTER
BRIDGE
STEREO FUNCTION SELECTOR SWITCH (M8B) SHOWN IN "REVERSE CHANNEL-REVERSE PHONO" POSITION. SWITCH SEQUENCE : 1. REV. CH. - REV. PH 2. REV. CH. 3. NORM. 4. REV. PH. 5. CAL.
PLAY-MONITOR SWITCH (M11) SHOWN IN PLAY POSITION.
TREBLE
BASS
VOLUME
BALANCE
LOUDNESS SWITCH (M10) SHOWN IN OFF POSITION.
CALIBRATION AMP
CHANNEL A-B MIXER
TAPE OUTPUT
CHANNEL A OUTPUT
BRIDGE OUTPUT
CHANNEL B OUTPUT
ROLL-OFF SWITCH (M5) SHOWN IN LP POSITION. SWITCH SEQUENCE : 1. LP 2. RIAA 3. AES 4. IEI.5 5. 5 6. FLAT 7. TAPE HEAD
SWITCH REAR VIEW OF M6, M7 & M9
ON-OFF SWITCH ON BRIDGE CONTROL
AC RECEPTACLES
HUM BALANCE
265V A SOURCE
265V B SOURCE
265V C SOURCE
185V SOURCE
335V
-5.5V

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 7025 | †275K | 120K | 3300Ω | 15Ω | 15Ω | †160K | 1meg | 1600Ω | 15Ω |
| V2 | 7025 | †57K | 100K | 560Ω | 15Ω | 15Ω | †110K | 530K | 910Ω | 15Ω |
| V3 | 7025 | †110K | 590K | 910Ω | 15Ω | 15Ω | †110K | 220K | 820Ω | 15Ω |
| V4 | 7025 | †275K | 120K | 3300Ω | 15Ω | 15Ω | †160K | 1meg | 1600Ω | 15Ω |
| V5 | 7025 | †57K | 500K | 560Ω | 15Ω | 15Ω | †110K | 120K | 910Ω | 15Ω |
| V6 | 7025 | †110K | 590K | 910Ω | 15Ω | 15Ω | †110K | 220K | 820Ω | 15Ω |
| V7 | 7025 | †110K | 100K | 820Ω | 15Ω | 15Ω | †110K | 400K | 820Ω | 15Ω |

† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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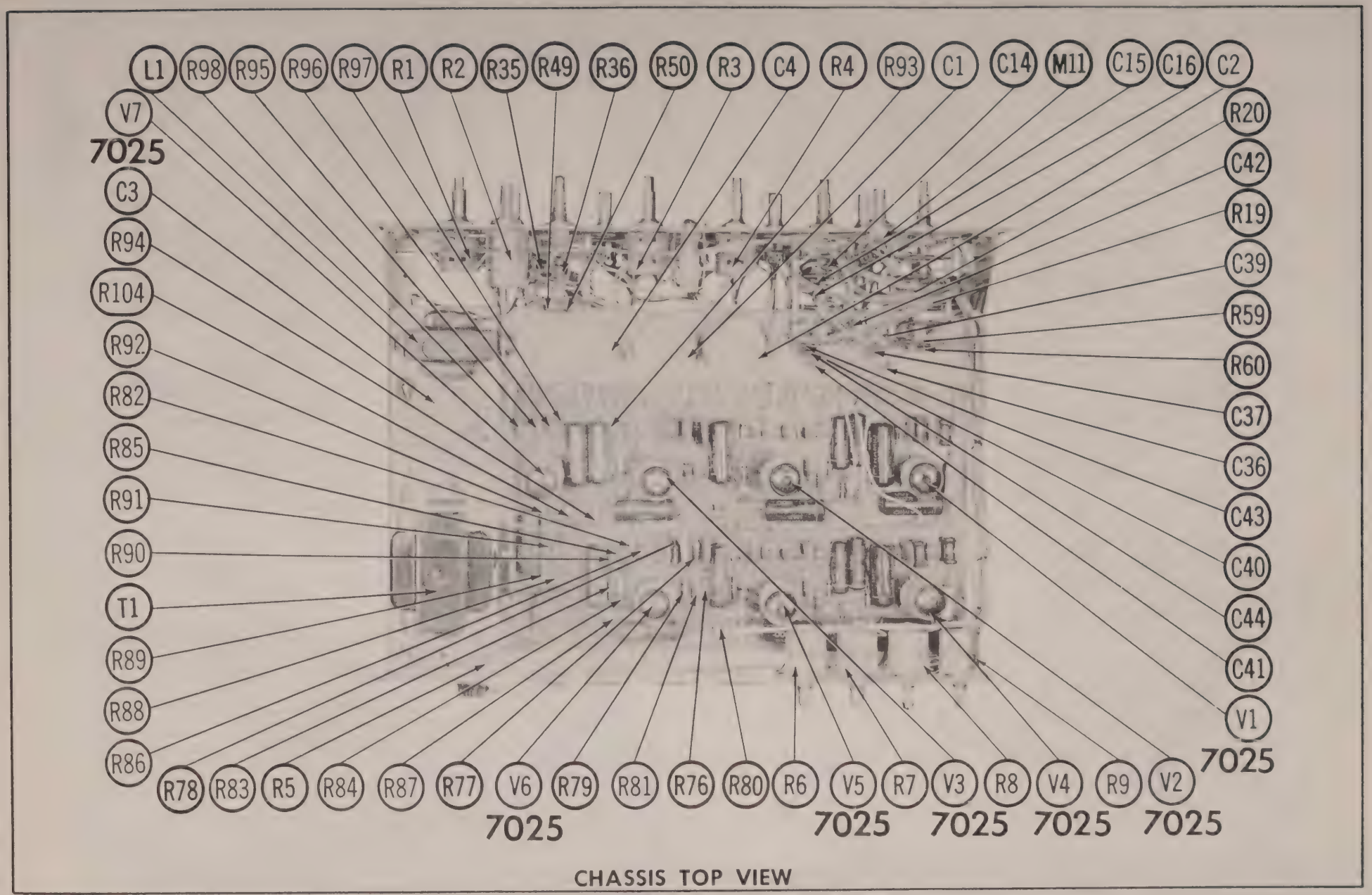
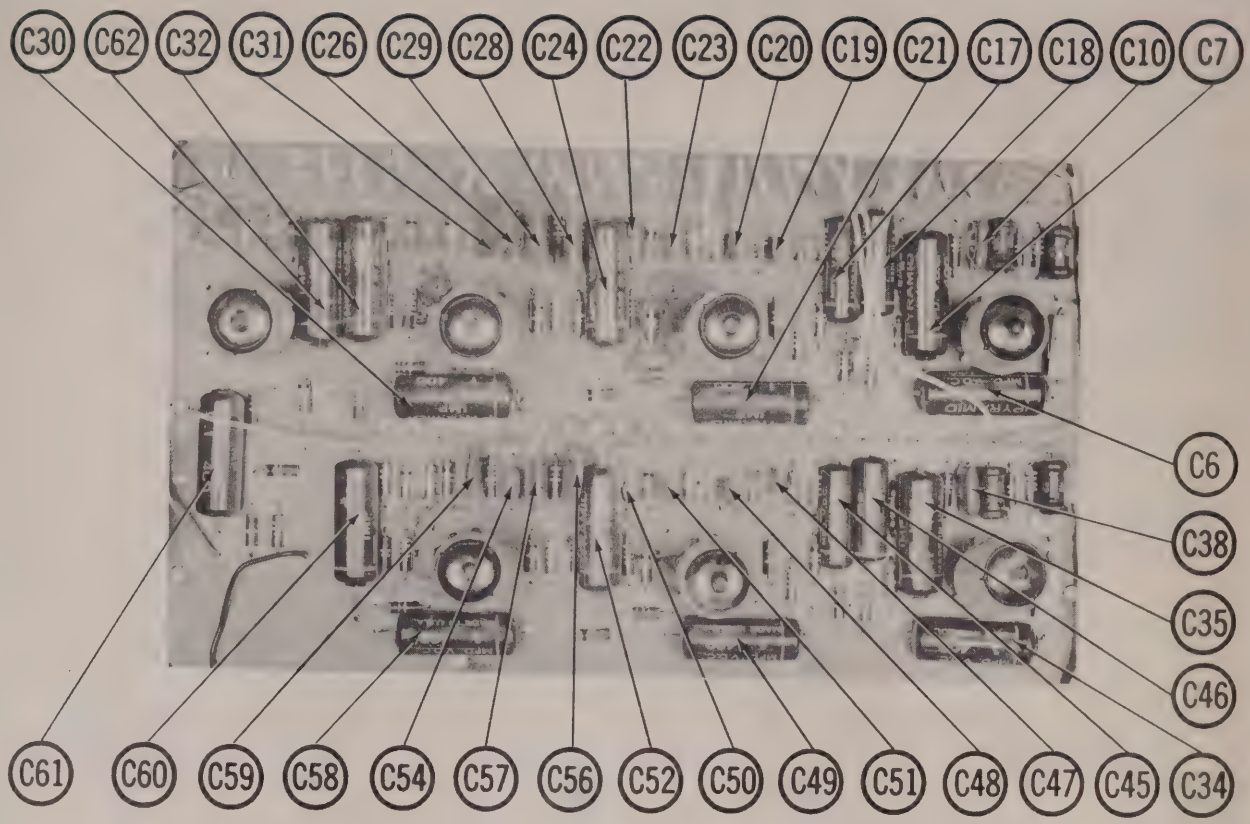
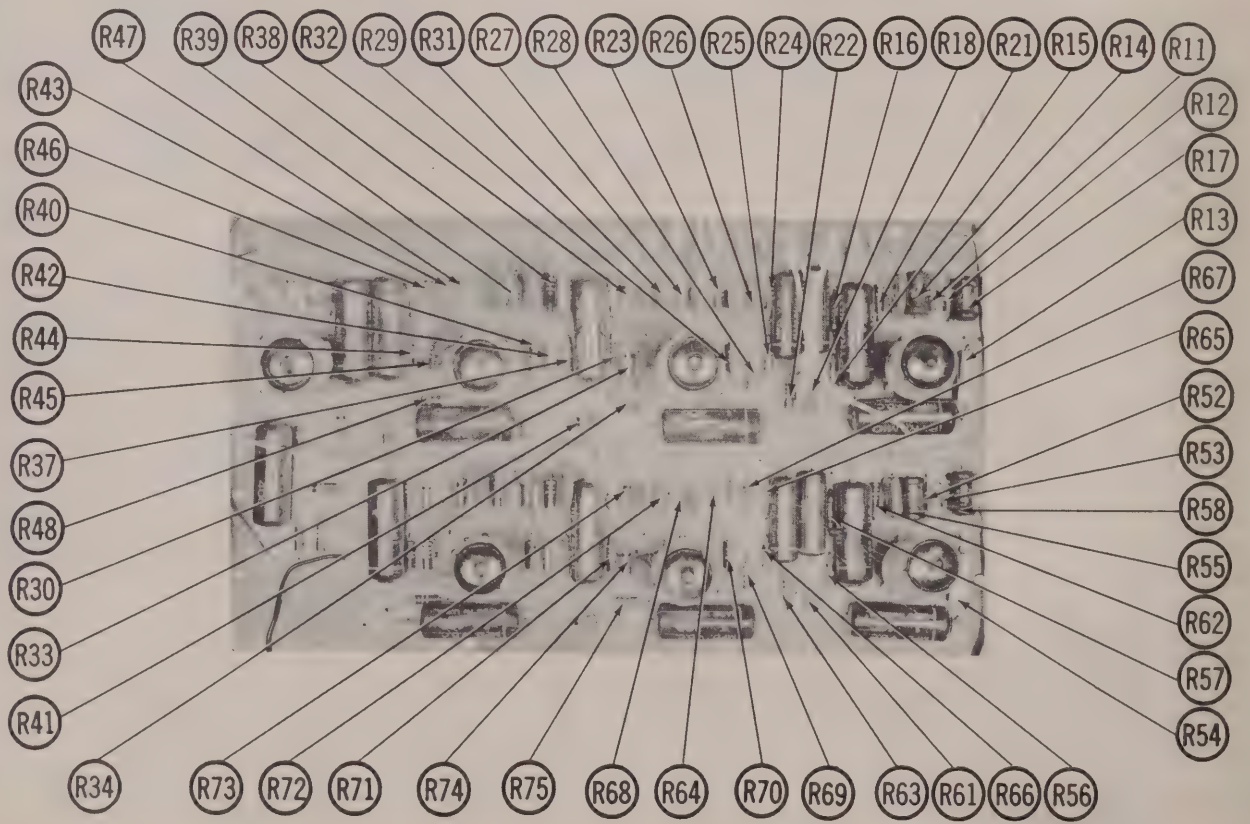
**LAFAYETTE MODELS KT-600, LT-600**




CHASSIS TOP VIEW
MODEL KT-600
LAFAYETTE




PRINTED BOARD — CAPACITOR IDENTIFICATION




PRINTED BOARD — RESISTOR IDENTIFICATION

# PARTS LIST AND DESCRIPTIONS

## TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

| ITEM No. | USE | TYPE |
|---|---|---|
| V1 | Channel A Preamplifier | 7025 |
| V2 | Channel A AF Amplifier | 7025 |
| V3 | Channel A AF Amplifier | 7025 |
| V4 | Channel B Preamplifier | 7025 |
| V5 | Channel B AF Amplifier | 7025 |
| V6 | Channel B AF Amplifier | 7025 |
| V7 | Calibration Amp. - Channel A-B Mixer | 7025 |

## ELECTROLYTIC CAPACITORS

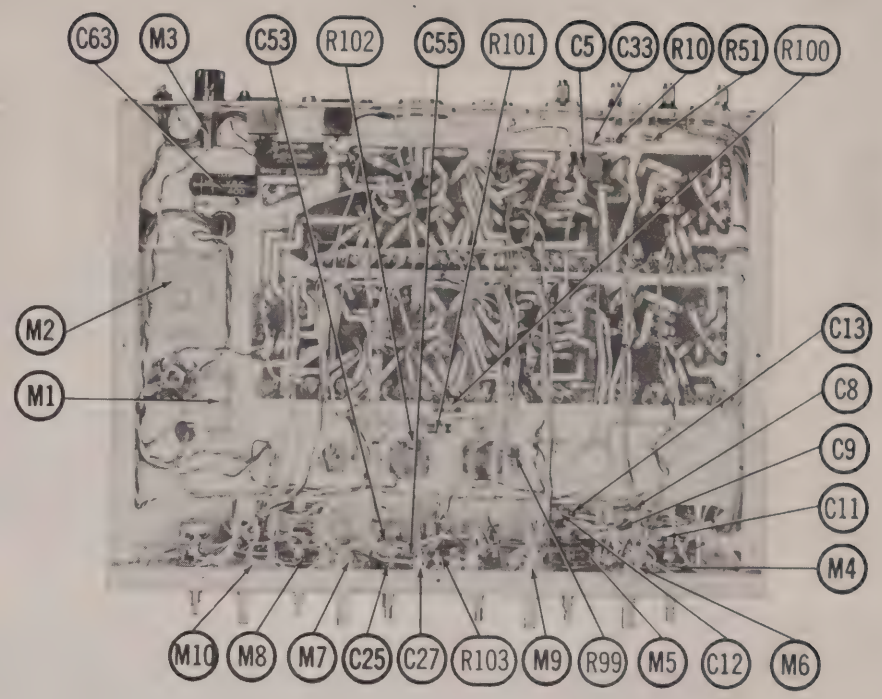
| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA Lafayette PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ▲10 | 475 | 12-49 | AFH3-50-07 | C0373 | FP396.12 | TMD-92 TD-30-500 | TVL-3842.6 | |
| B | ■30 | 475 | | | | | | | |
| C | ▲40 | 475 | | | | | | | |
| C2A | ▲40 | 350 | 12-50 | AFH4-53 | D0460 | FP346 TC78 | TMQ-58 | TVL-4622.3 | |
| B | ▲40 | 350 | | | | | | | |
| C | ■ 40 | 350 | | | | | | | |
| D | 40 | 25 | | | | | | | |
| C3 | 3000 | 15 | 12-47 | AFH1-04 | A0080 | WP042 | TMS-6 | TVL-1170 | |
| C4A | ■40 | 25 | 12-48 | AFH3-02 | C0020 | WP520 | TMT-2 | TVL-3230 | |
| B | ▲ 40 | 25 | | | | | | | |
| C | 40 | 25 | | | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C5 | 68 NPO 10% | | NPO-DI 68 | DTZ-68 | C10Q68C | CCTO-680 | CNO-468 | 10TCC-Q68 |
| C6 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C7 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C8 | 1000 5% | | 1469-001 | | 1R5D1 | CM-19B-102J | MCJ255 | MS-21 |
| C9 | 1000 5% | | 1469-001 | | 1R5D1 | CM-19B-102J | MCJ255 | MS-21 |
| C10 | 1000 5% | | 1469-001 | | 1R5D1 | CM-19B-102J | MCJ255 | MS-21 |
| C11 | 150 5% | | 1469-00015 | TCZ-150 | 22R5T15 | CM-19B-151J | MCE236 | MS-315 |
| C12 | 220 5% | | 1469-00022 | TCZ-220 | 22R5T22 | CM-19B-221J | CNO-322 | MS-322 |
| C13 | 100 5% | | 1469-0001 | TCZ-100 | 22R5T1 | CM-19B-101J | CNO-310 | MS-31 |
| C14 | 180 5% | | 1469-00018 | TCZ-180 | 22R5T18 | CM-19B-181J | CNO-318 | MS-318 |
| C15 | 250 5% | | 1469-00025 | TCZ-240 | 22R5T25 | CM-19B-251J | MCE240 | MS-325 |
| C16 | 150 5% | | 1469-00015 | TCZ-150 | 22R5T15 | CM-19B-151J | MCE236 | MS-315 |
| C17 | .033 200V 10% | | V84C2S33-10% | | PM4S33 | 4DP-2-333 | GEM-1613 | 6TM-S33 |
| C18 | .05 200V 10% | | V84C2S5-10% | | PM2S5 | 4DP-3-503 | GEM-1615 | 2TM-S5 |
| C19 | 1000 10% | | DI-1000 | DD-102 | PM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C20 | 1000 10% | | DI-1000 | DD-102 | PM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C21 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C22 | 390 5% | | 1469-00039 | | 22R5T39 | CM-19B-391J | MCE243 | MS-339 |
| C23 | 1000 10% | | DI-1000 | DD-102 | PM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C24 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C25 | 43 5% | | 1469-000043 | TCZ-43 | 22R5Q43 | CM-19B-430J | CNO-447 | MS-443 |
| C26 | 100 5% | | 1469-0001 | TCZ-100 | 22R5T1 | CM-19B-101J | MCE235 | MS-31 |
| C27 | 82 5% | | 1469-000082 | TCZ-82 | 22R5Q82 | CM-19B-820J | CNO-482 | MS-482 |
| C28 | 5000 5% | | | | 1DR5D5 | CM-19B-502J | MCE465 | MS-25 |
| C29 | 5000 5% | | | | 1DR5D5 | CM-19B-502J | MCE465 | MS-25 |
| C30 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C31 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C32 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C33 | 68 NPO 10% | | NPO-DI 68 | DTZ-68 | C10Q68C | CCTO-680 | CNO-468 | 10TCC-Q68 |
| C34 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C35 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C36 | 1000 5% | | 1469-001 | | 1R5D1 | CM-19B-102J | MCJ255 | MS-21 |
| C37 | 1000 5% | | 1469-001 | | 1R5D1 | CM-19B-102J | MCJ255 | MS-21 |
| C38 | 1000 5% | | 1469-001 | | 1R5D1 | CM-19B-102J | MCJ255 | MS-21 |
| C39 | 150 5% | | 1469-00015 | TCZ-150 | 22R5T15 | CM-19B-151J | MCE236 | MS-315 |
| C40 | 220 5% | | 1469-00022 | TCZ-220 | 22R5T22 | CM-19B-221J | CNO-322 | MS-322 |
| C41 | 100 5% | | 1469-0001 | TCZ-100 | 22R5T1 | CM-19B-101J | CNO-310 | MS-31 |
| C42 | 180 5% | | 1469-00018 | TCZ-180 | 22R5T18 | CM-19B-181J | CNO-318 | MS-318 |
| C43 | 250 5% | | 1469-00025 | TCZ-240 | 22R5T25 | CM-19B-251J | MCE-240 | MS-325 |

# CHASSIS—BOTTOM VIEW




## FIXED CAPACITORS (cont)

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C44 | 150 5% | | 1469-00015 | TCZ-150 | 22R5T15 | CM-19B-151J | MCE236 | MS-315 |
| C45 | .033 200V 10% | | V84C2S33-10% | | PM4S33 | 4DP-2-333 | GEM-1613 | 6TM-S33 |
| C46 | .05 200V 10% | | V84C2S5-10% | | PM2S5 | 4DP-3-503 | GEM-1615 | 2TM-S5 |
| C47 | 1000 10% | | DI-1000 | DD-102 | PM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C48 | 1000 10% | | DI-1000 | DD-102 | PM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C49 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C50 | 390 5% | | 1469-00039 | | 22R5T39 | CM-19B-391J | MCE243 | MS-339 |
| C51 | 1000 10% | | DI-1000 | DD-102 | PM6D1 | CCD-102 | GP210 | 10TS-D10 |
| C52 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C53 | 43 5% | | 1469-000043 | TCZ-43 | 22R5Q43 | CM-19B-430J | CNO-447 | MS-443 |
| C54 | 100 5% | | 1469-0001 | TCZ-100 | 22R5T1 | CM-19B-101J | MCE235 | MS-31 |
| C55 | 82 5% | | 1469-000082 | TCZ-82 | 22R5Q82 | CM-19B-820J | CNO-482 | MS-482 |
| C56 | 5000 5% | | | | 1DR5D5 | CM-19B-502J | MCE465 | MS-25 |
| C57 | 5000 5% | | | | 1DR5D5 | CM-19B-502J | MCE465 | MS-25 |
| C58 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C59 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C60 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C61 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C62 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C63 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |

# PARTS LIST AND DESCRIPTIONS (Continued)

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA Lafayette PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500K 100K Tap | 1/2 | 11-17 | | | | | Volume, Channel A |
| B | 500K 100K Tap | 1/2 | | | | | | Balance, Channel B |
| R2A | 500K | 1/2 | 11-18 | B-58 | | Q13-133 | | Bridge, Channel B |
| B | 500K | 1/2 | | SR-59 | | M11-133 | ■ UE1394S | Bridge, Channel A |
| C | Switch | | | KR-1 | | 76-1 | | |
| R3A | 500K 250K Tap | 1/2 | 11-21 | F3-42 | | † QJ1139R | | Treble, Channel A |
| B | 500K 250K Tap | 1/2 | | R4-42 | | | | Treble, Channel B |
| R4A | 1meg 500K Tap | 1/2 | 11-20 | F1-56 * | | ‡ QJ1138R | ▲ UE4080 | Bass, Channel A |
| B | 1meg 500K Tap | 1/2 | | R2-56 * | | | | Bass, Channel B |
| R5A | 750Ω | 1/2 | 11-19 | AB-5 | A47-750-S | Q11-105 | | Hum Balance |
| B | Shaft | | | AK-1 | FKS-1/4 | Not Req. | | |
| R6A | 250K | 1/2 | 11-16 | F1-35 | | †† QJ-1137R | ▲ UE4079 | Aux. Level, Channel A |
| B | 250K | 1/2 | | R2-35 | | | | Aux. Level, Channel B |
| R7A | 250K | 1/2 | 11-16 | F1-35 | | †† QJ-1137R | ▲ UE4079 | Tape Level, Channel A |
| B | 250K | 1/2 | | R2-35 | | | | Tape Level, Channel B |
| R8A | 250K | 1/2 | 11-16 | F1-35 | | †† QJ-1137R | ▲ UE4079 | Tuner Level, Channel A |
| B | 250K | 1/2 | | R2-35 | | | | Tuner Level, Channel B |
| R9A | 250K | 1/2 | 11-16 | F1-35 | | †† QJ-1137R | ▲ UE4079 | Phono Level, Channel A |
| B | 250K | 1/2 | | R2-35 | | | | Phono Level, Channel B |

† "Concentrikit" equivalent: K-5 kit with base elements and shafts: B19-133X, P1-030 (Panel). Not available as a factory assembled unit. B19-133X, R1-108 (Rear)

‡ "Concentrikit" equivalent: K-5 kit,with base elements and shafts: B19-137X, P1-030 (Panel) Not available as a factory assembled unit. B19-137X, R1-108 (Rear)

†† "Concentrikit" equivalent: K-5 kit with base elements and shafts: B13-130, P9-021 (Panel) Not available as a factory assembled unit. B13-130, R1-024 (Rear)

▲ "STA-LOC" equivalent: FA254L, RU254L, OK625, IS875.

▲ "STA-LOC" equivalent: FB16T55, RU16T55, OS937A, IS1250.

■ "STA-LOC" equivalent: FB55A, RU55A, CS3500, US41.

* Use when tap is not used.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R10 | 120K | |
| R11 | 22K | |
| R12 | 470K | |
| R13 | 220K 5% | |
| R14 | 3300Ω 5% | |
| R15 | 1meg | |
| R16 | 100K 5% | |
| R17 | 1600Ω 5% | |
| R18 | 39K | |
| R19 | 1.5meg | |
| R20 | 3.9meg | |
| R21 | 110K 5% | |
| R22 | 2.2meg | |
| R23 | 22K | |
| R24 | 47K | |
| R25 | 100K | |
| R26 | 150K | |
| R27 | 47K | |
| R28 | 47K | |
| R29 | 560Ω | |
| R30 | 47K | |
| R31 | 220K | |
| R32 | 1meg | |
| R33 | 100K | |
| R34 | 910Ω 5% | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R35 | 100K 5% | |
| R36 | 100K 5% | |
| R37 | 120K 5% | |
| R38 | 470K 5% | |
| R39 | 120K 5% | |
| R40 | 1000Ω | |
| R41 | 100K | |
| R42 | 910Ω 5% | |
| R43 | 27K | |
| R44 | 220K | |
| R45 | 390K | |
| R46 | 1meg | |
| R47 | 100K | |
| R48 | 820Ω | |
| R49 | 1000Ω 5% | |
| R50 | 1000Ω 5% | |
| R51 | 120K | |
| R52 | 22K | |
| R53 | 470K | |
| R54 | 220K 5% | |
| R55 | 3300Ω 5% | |
| R56 | 1meg 5% | |
| R57 | 100K 5% | |
| R58 | 1600Ω 5% | |
| R59 | 3.9meg | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R60 | 1.5meg | |
| R61 | 39K | |
| R62 | 110K 5% | |
| R63 | 2.2meg | |
| R64 | 22K | |
| R65 | 47K | |
| R66 | 100K | |
| R67 | 150K | |
| R68 | 47K | |
| R69 | 47K | |
| R70 | 560Ω | |
| R71 | 47K | |
| R72 | 220K | |
| R73 | 1meg | |
| R74 | 100K | |
| R75 | 910Ω 5% | |
| R76 | 120K 5% | |
| R77 | 470K 5% | |
| R78 | 120K 5% | |
| R79 | 1000Ω | |
| R80 | 100K | |
| R81 | 910Ω 5% | |
| R82 | 27K | |
| R83 | 220K | |
| R84 | 390K | |

## RESISTORS (cont)

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R85 | 1meg | |
| R86 | 100K | |
| R87 | 820Ω | |
| R88 | 240K 5% | |
| R89 | 1meg | |
| R90 | 240K 5% | |
| R91 | 100K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R92 | 820Ω | |
| R93 | 470K | |
| R94 | 470K | |
| R95 | 100K | |
| R96 | 220K | |
| R97 | 1meg | |
| R98 | 820Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R99 | 47K 1W | |
| R100 | 10K 2W | |
| R101 | 10K 1W | |
| R102 | 10K | |
| R103 | 47Ω 2W | |
| R104 | 100K | |

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | REPLACEMENT DATA Lafayette PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 117V ⓐ .35A | 330V ⓐ .015A | 12 VCT ⓐ 1.2A | 15-9 | | | | | | |

## RECTIFIERS

| ITEM No. | RATING CURRENT (Measured) | REPLACEMENT DATA Lafayette PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | .015A | ① 17-7 | | | 126-25H-Q① | | ① Selenium Type |
| M2 | 1.2A | ① 17-6 | | 1186① | 5526-1B1-RV① | | |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA Lafayette PART No. FUSE | Lafayette PART No. HOLDER | LITTELFUSE PART No. FUSE | LITTELFUSE PART No. HOLDER | BUSS PART No. FUSE | BUSS PART No. HOLDER |
|---|---|---|---|---|---|---|---|---|
| M3 | 3AG | 1A 250V | 20-9 | 20-14 | 312001 (3AG 1A 250V) | 342001 | AGC 1 | HKP |

## MISCELLANEOUS

| ITEM No. | PART NAME | Lafayette PART No. | NOTES |
|---|---|---|---|
| M4A | Switch | 14-14 | Selector (Phono Turnover) Dual Concentric Channel A |
| B | Switch | | Channel B |
| M5A | Switch | 14-13 | Roll Off, Dual Concentric Channel A |
| B | Switch | | Channel B |
| M6 | Switch | 14-12 | Rumble Filter (Off-On) |
| M7 | Switch | 14-12 | Presence (Off-On) |
| M8A | Switch | 14-15 | Stereo Function (Input) |
| B | Switch | | Stereo Function (Output) |
| M9 | Switch | 14-12 | Scratch Filter (Off-On) |
| M10 | Switch | 14-11 | Loudness |
| M11 | Switch | 14-20 | Play-Monitor |
| | Printed Board | 16-9 | |

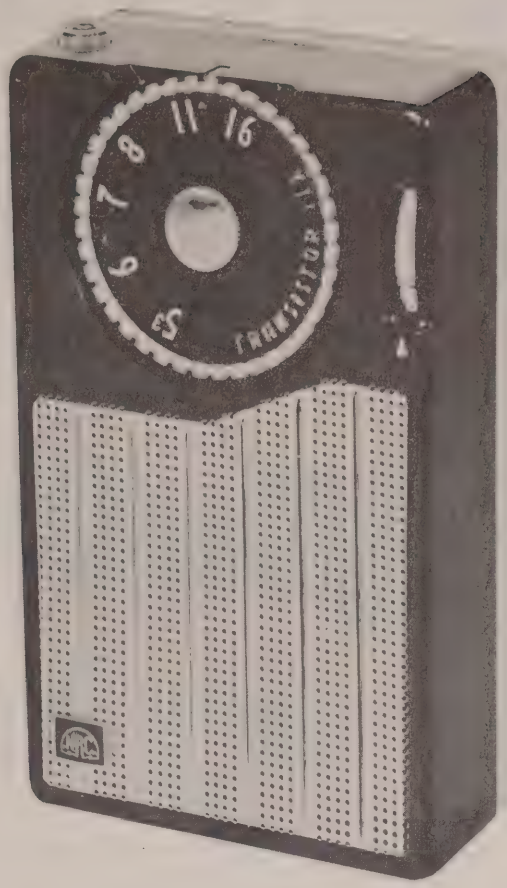
## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®






| | |
|---|---|
| TRADE NAME | Nanola (Nanao) Model 6TP-106 |
| IMPORTER | Leopold Sales Corp., P. O. Box 276, Highland Park, Illinois |
| TYPE SET | Battery Operated Transistorized Portable AM Receiver |
| POWER SUPPLY | 9 Volts DC |
| TUNING RANGE—BROADCAST | 535 – 1640KC |
| RATING | 5MA@9 Volts DC (No Signal, Min. Volume)<br>10MA@9 Volts DC (Signal, Normal Volume) |

# ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2, A3, A5.... GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537
A4, A6..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | Loop | 455KC (400~ Mod.) | Tuning gang fully open. | Across voice coil. | A1, A2, A3 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 2. | " | 1600KC | 1600KC | " | A4 | " |
| 3. | " | 600KC | 600KC | " | A5 | " |
| 4. | " | 1400KC | Tune to 1400KC signal | " | A6 | Adjust for maximum output while rocking tuning gang. |

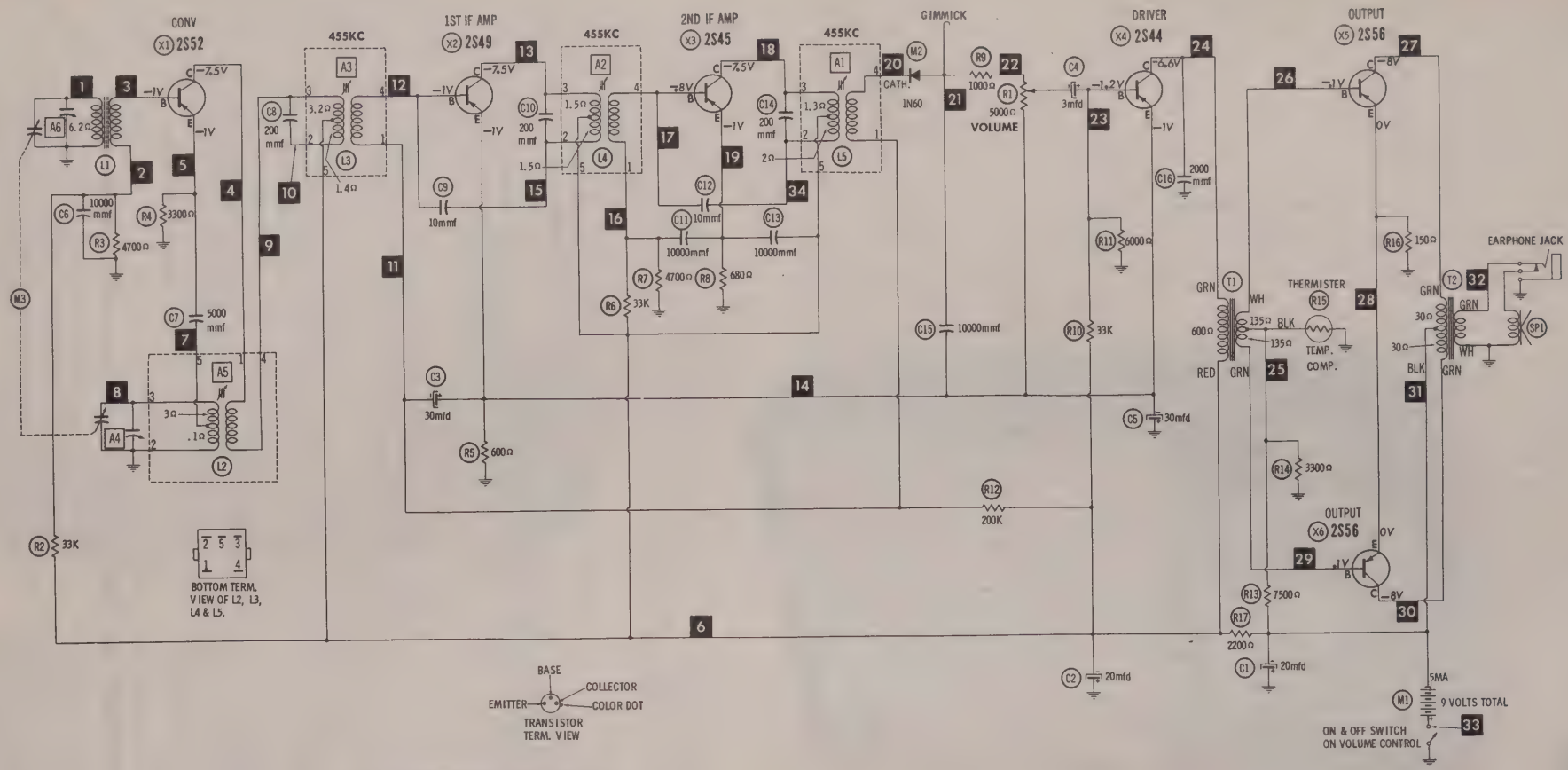
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JF675



NANOLA (NANAO)
MODEL 6TP-106
NANOLA (NANAO)
MODEL 6TP-106
SET 476 FOLDER 8




RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

**DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM**

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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**NANOLA (NANAO)**
**MODEL 6TP-106**

# PARTS LIST AND DESCRIPTIONS

## TRANSISTORS

| ITEM No. | ORIG. TYPE | USE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | CBS PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| X1 | 2S52 | Converter | | 2N412 | 2N486 | 2N412 | PNP |
| X2 | 2S49 | 1st IF Amplifier | | | | | PNP |
| X3 | 2S45 | 2nd IF Amplifier | | 2N410 | 2N483 | 2N410 | PNP |
| X4 | 2S44 | Driver | | | 2N362 | | PNP |
| X5 | 2S56 | Output | | 2N408 | 2N632 | 2N408 | PNP } Matched |
| X6 | 2S56 | Output | | 2N408 | 2N632 | 2N408 | PNP } Pair |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | NANOLA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1 | 20 | 10 | | XPP-10020 | NLW20-12 | | | TE-1130 | |
| C2 | 20 | 10 | | XPP-10020 | NLW20-12 | | | TE-1130 | |
| C3 | 30 | 3 | | XPP-3030 | NLW30-6 | | ML30-6 | TE-1092 | |
| C4 | 3 | 6 | | XPP-6003 | NLW3-25 | TT6X3 | ML4-6 | TE-1082 | |
| C5 | 30 | 3 | | XPP-3030 | NLW30-6 | | ML30-6 | TE-1092 | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C6 | 10000 | | C80V103AM | DDM-103 | BYA10S1 | | GP110 | 5HK-S10 |
| C7 | 5000 | | BPD-005 | DDM-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C8 | 200 | | SI 200 | D6-201 | L10T2 | CCD-201 | GP320 | 10TS-T20 |
| C9 | 10 | | DI-10 | DD-100 | L10Q1 | CCD-100 | GP410 | 10TS-Q10 |
| C10 | 200 | | SI 200 | D6-201 | L10T2 | CCD-201 | GP320 | 10TS-T20 |
| C11 | 10000 | | C80V103AM | DDM-103 | BYA10S1 | | GP110 | 5HK-S10 |
| C12 | 10 | | DI-10 | DD-100 | L10Q1 | CCD-100 | GP100 | 10TS-Q10 |
| C13 | 10000 | | C80V103AM | DDM-103 | BYA10S1 | | GP110 | 5HK-S10 |
| C14 | 200 | | SI 200 | D6-201 | L10T2 | CCD-201 | GP320 | 10TS-T20 |
| C15 | 10000 | | C80V103AM | DDM-103 | BYA10S1 | | GP110 | 5HK-S10 |
| C16 | 2000 | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | NANOLA PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1 | 5000Ω | 1/4 | | B16-214 | | | | Volume & Switch |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

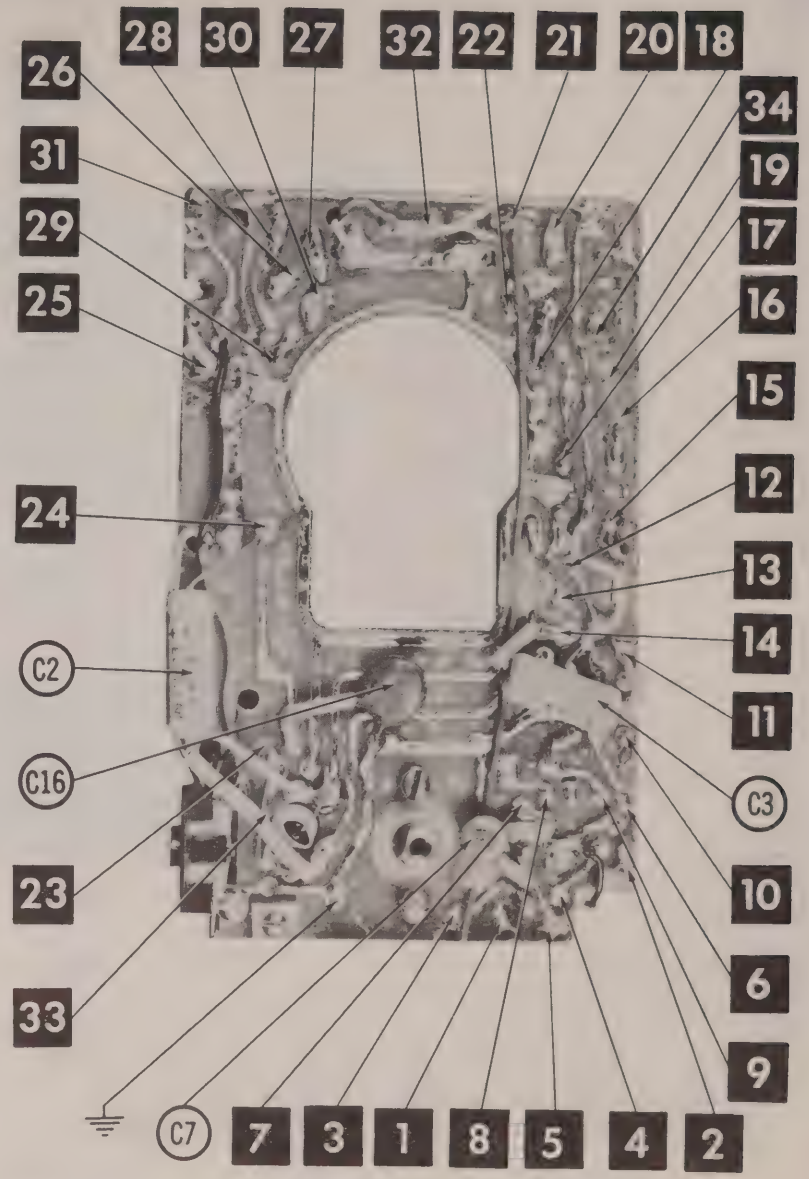
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R2 | 33K | |
| R3 | 4700Ω | |
| R4 | 3300Ω | |
| R5 | 600Ω | |
| R6 | 33K | |
| R7 | 4700Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R8 | 680Ω | |
| R9 | 1000Ω | |
| R10 | 33K | |
| R11 | 6000Ω | |
| R12 | 200K | |
| R13 | 7500Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R14 | 3300Ω | Temp. Comp. |
| R15 | | |
| R16 | 150Ω | |
| R17 | 2200Ω | |

# PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo



# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | NANOLA PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Loopstick | | | | | | | |
| L2 | Osc. Coil | | | | | | | |
| L3 | 1st IF Trans. | | | | | | | |
| L4 | 2nd IF Trans. | | | | | | | |
| L5 | 3rd IF Trans. | | | | | | | |

## TRANSFORMER (DRIVER)

| ITEM No. | TURNS RATIO | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | NANOLA PART No. | Halldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 1: | 1 | R-3202 | | | | | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | NANOLA PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 120Ω CT | 6-8Ω | R-3201 | | | | | | | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | NANOLA PART No. | QUAM PART No. | |
| SP1 | 2 1/4" | PM | 6-8Ω | | 22A06Z8 | |

## BATTERIES

| ITEM No. | VOLTAGE | NANOLA PART No. | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | BURGESS | | EVEREADY | | MALLORY | | |
| | | | "A" | "B" | "A" | "B" | "A" | "B" | |
| M1 | 9V | | | 2U6 | | 216 | | M-1604 | |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|
| | | NANOLA PART No. | CBS PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| M2 | 1N60 | 1N60 | 1N60 | 1N60 | 1N60 | Detector (Pigtail) |

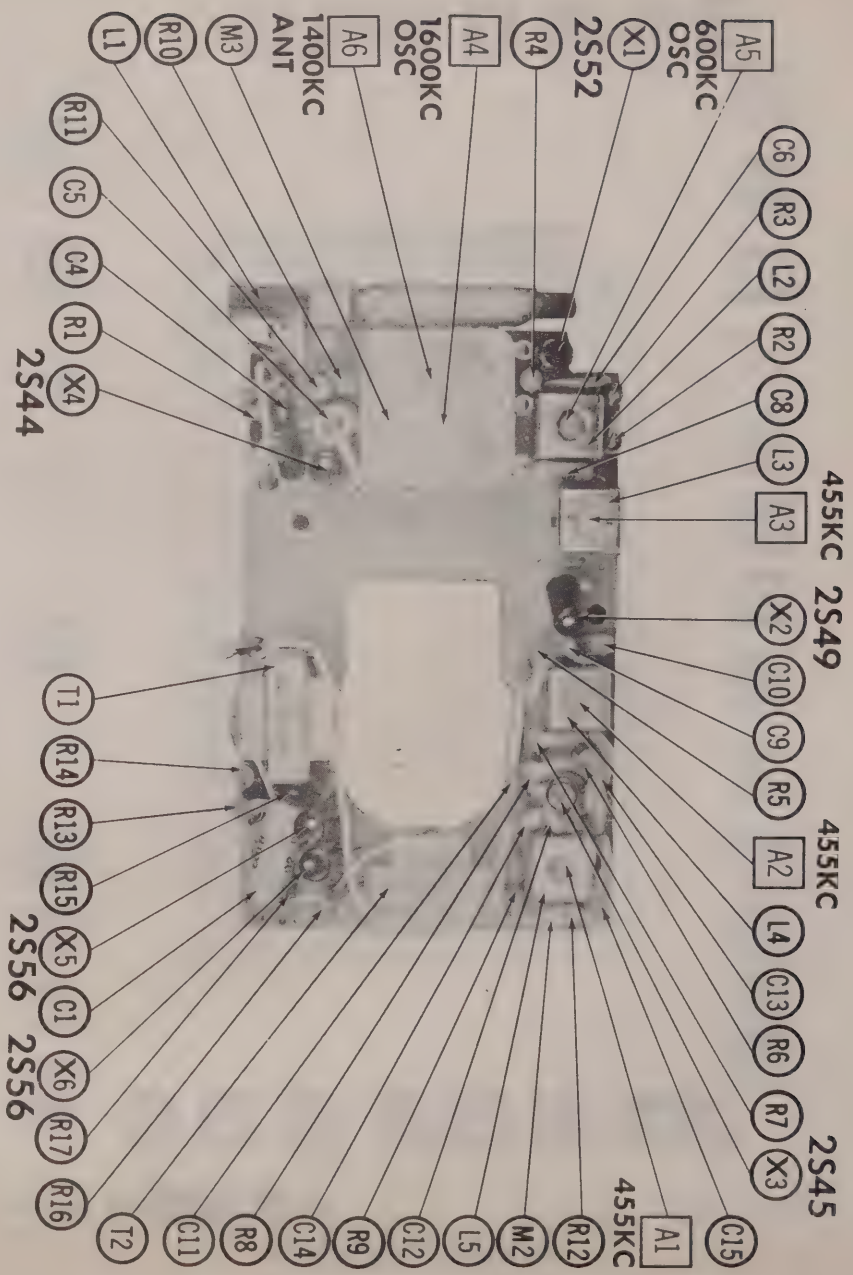
## MISCELLANEOUS

| ITEM No. | PART NAME | NANOLA PART No. | NOTES |
|---|---|---|---|
| M3 | Tuning Cap. | | 2 Gang |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

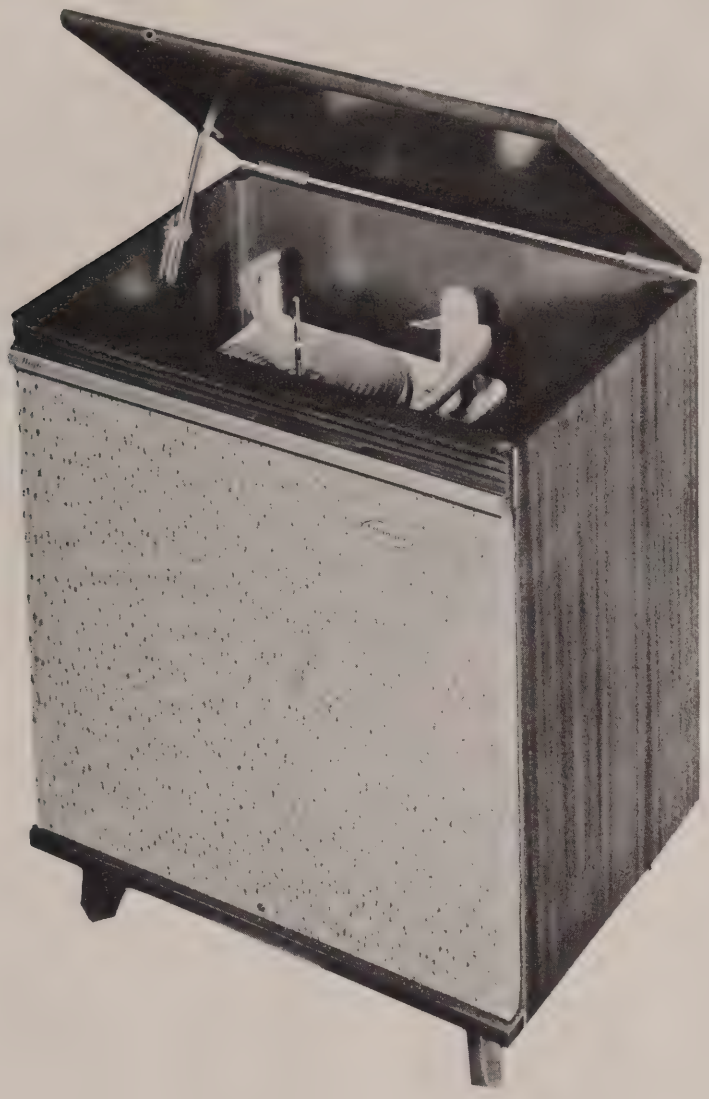
## CHASSIS—TOP VIEW



PHOTOFACT® Folder

# OLYMPIC MODELS
# 653, 723M

OLYMPIC MODELS
653, 723M



OLYMPIC MODELS
653, 723M

| | |
|---|---|
| TRADE NAME | Olympic Models 653, 723M |
| MANUFACTURER | Olympic Radio & TV Inc., 34-01 38th Ave., Long Island City 1, N. Y. |
| TYPE SET | AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 105-125 Volts AC, 60 Cycles RATING 27 Watts, .30 Amp. @ 117 Volts AC (Less Motor) |

FOR SERVICE INFORMATION ON RECORD CHANGER PART #RX25907-1 - SEE SIMILAR MONARCH UA8 - PHOTOFACT SET 381 FOLDER 11

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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# PARTS LIST AND DESCRIPTIONS

## TUBES

| ◆ CBS ◆ | | GENERAL ELECTRIC ◆ | | RAYTHEON ◆ | | SYLVANIA ◆ | |
|---|---|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE | | |
| V1 | AF Amplifier | 12AV6 | V3 | Rectifier | 35W4 | | |
| V2 | Output | 50C5 | | | | | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | OLYMPIC PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | 80 | 150 | C025365 ① | PRS4650 | BBRT84215 | TCT3118 | CDB-T-1002 | TVA-3455 | |
| B | 60 | 150 | | | | | | | |
| C | 20 | 25 | | | | | | | |

① In some versions, C1C may be 25mfd.

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C2 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C3 | 330 10% | | DI-330 | DD-331 | L10T33 | CCD-331 | GP333 | 10TS-T33 |
| C4 | 470 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C5 | .0047 600V | | P688N-0047 | D6-472 | CUB6D47 | 6DP-1-472 | GEM-6247 | 6TM-D47 |
| C6 | .0047 600V | | P688N-0047 | D6-472 | CUB6D47 | 6DP-1-472 | GEM-6247 | 6TM-D47 |
| C7 | .047 400V | | P488N-047 | DD-503 | CUB4S5 | 4DP-3-473 | GEM-4147 | 4TM-S47 |
| C8 | .1 400V | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | OLYMPIC PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 2meg 600K tap | ½ | PT567 | BT-80 | A47F6-2meg | Q13-139X | UT-449 | Loudness |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| R2A | 3meg | ½ | PT2160 | B-85 | A47-3meg-Z | Q13-140 | U57 | Tone |
| B | Shaft | | | Not Req. | KSS-3 | Not Req. | Not Req. | |
| C | Switch | | | KR-3 | SWE-21 | 76-2 | US-28 | Power On-Off |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R3 | 1meg | |
| R4 | 100K | |
| R5 | 150Ω | |

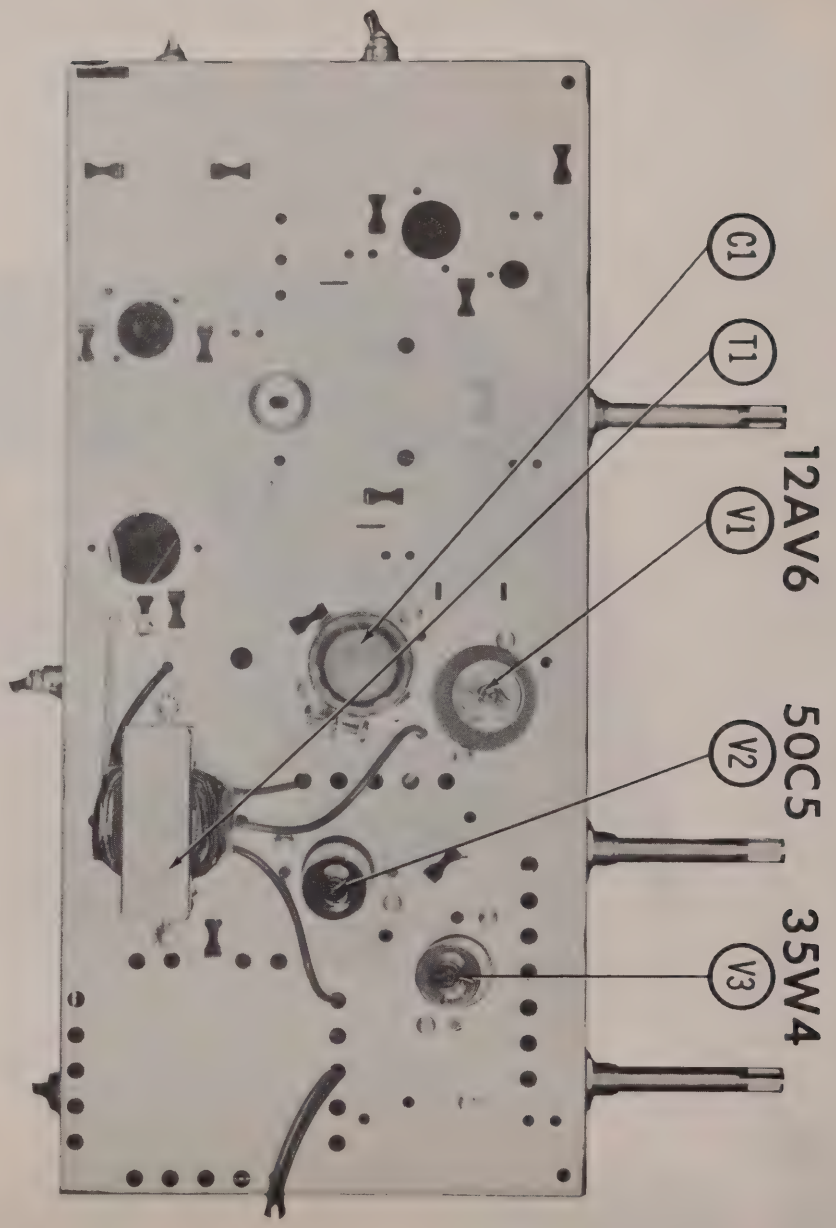
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R6 | 1000Ω | |
| R7 | 130Ω 4W | |
| R8 | 220K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R9 | 180Ω 1W | |

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | OLYMPIC PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K1 | Audio Coupling | (2) 125mmf, 220mmf, 2000mmf, 5000mmf, 470K, 470K, 6.8meg | PC-2477 | Aerovox PA-113-1<br>Centralab PC-150<br>Cornell-Dubilier 116TM1<br>Mallory MS-106<br>Sprague DT-1 |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | OLYMPIC PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2400Ω Tap @ 6% | 3-4Ω | TR2690-1 | 24S50A ① | A-3031 ① | | A-3330 ① | 24S50A ① | S-16X ① | ① Drill new mounting hole. |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | OLYMPIC PART No. | QUAM PART No. | |
| SP1 | 8" | PM | 3-4Ω | SK1906 | 8A31 | |
| SP2 | 4" | PM | 3-4Ω | SK4342 | 4A07 | |
| SP3 | 4" | PM | 3-4Ω | SK4342 | 4A07 | |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | OLYMPIC PART No. | ASTATIC PART No. | | ELECTRO-VOICE PART No. | | JENSEN PART No. | | SONOTONE PART No. | |
| | | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE |
| M1 | | 13TB | Not Req. | 26S | Not Req. | | | 8TA4-S | N-8TA-S |

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA | | | REMARKS |
|---|---|---|---|---|
| | OLYMPIC PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | |
| M2 | | W-101STS † or W-102S † or W-101STD ♦ and W-102MGS † or W-102MGD ♦ | E98 † or E98D ♦ and E98X † or E98XD ♦ | † Jewel ♦ Diamond |

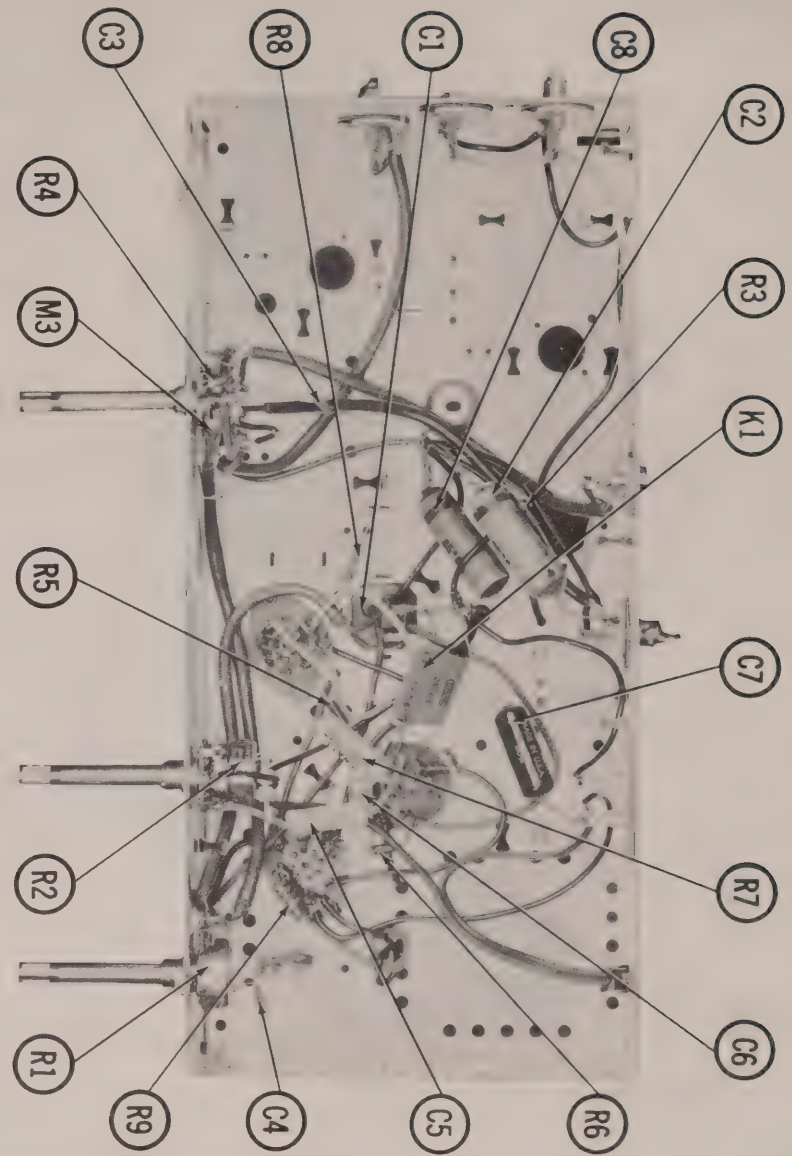
## MISCELLANEOUS

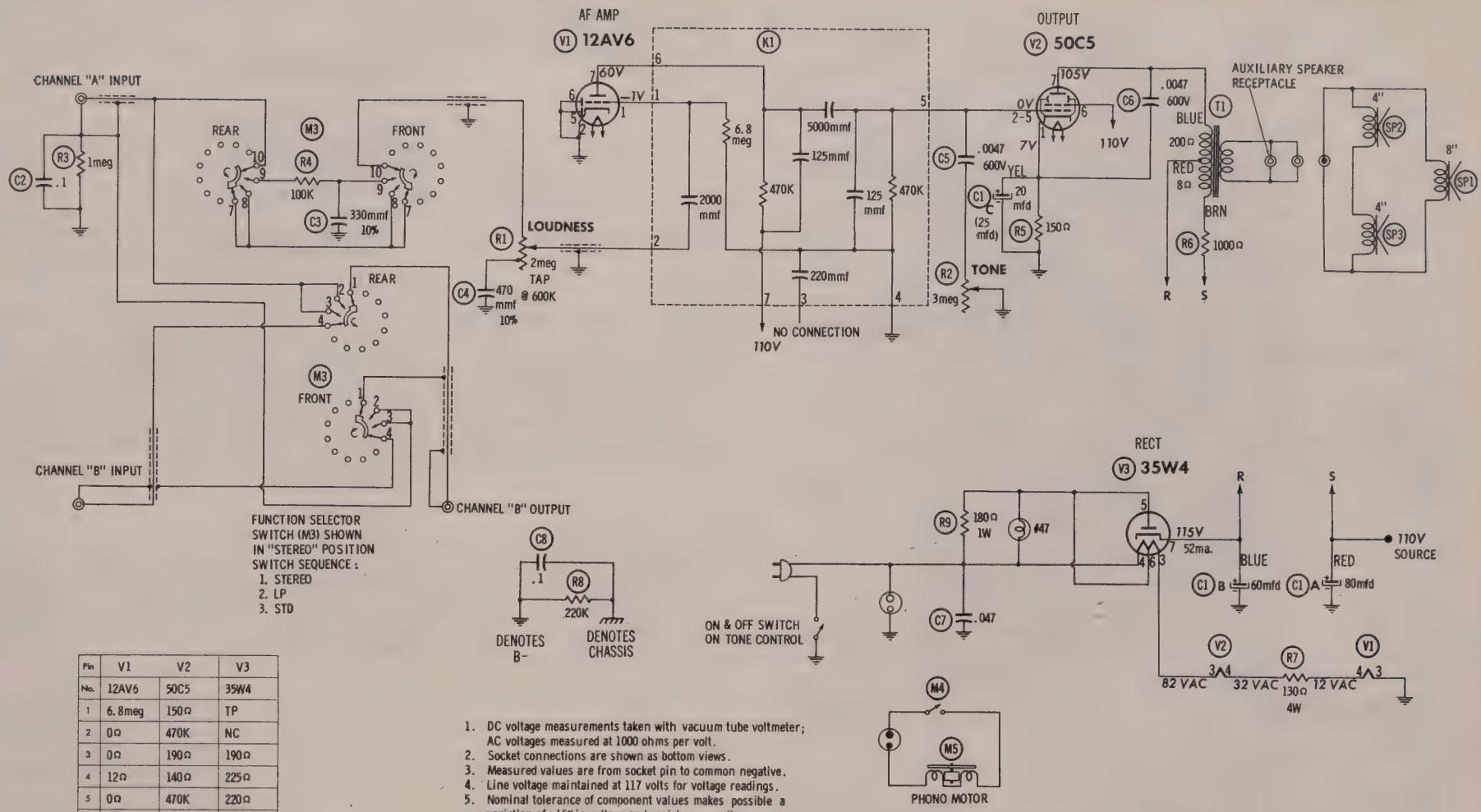
| ITEM No. | PART NAME | OLYMPIC PART No. | NOTES |
|---|---|---|---|
| M3 | Switch | SW2689 | Function Selector |
| M4 | Switch | | Off-On (Part of Changer) |
| M5 | Motor | | Phono Drive (Part of Changer) |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

## CHASSIS—BOTTOM VIEW






| Pin No. | V1 | V2 | V3 |
|---|---|---|---|
| 1 | 6.8meg | 150Ω | TP |
| 2 | 0Ω | 470K | NC |
| 3 | 0Ω | 190Ω | 190Ω |
| 4 | 12Ω | 140Ω | 225Ω |
| 5 | 0Ω | 470K | 220Ω |
| 6 | 0Ω | †1000Ω | 220Ω |
| 7 | †470K | †200Ω | 20K(Min.) |

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

**DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM**

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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**OLYMPIC MODELS**
**653, 723M**

PHOTOFACT® Folder

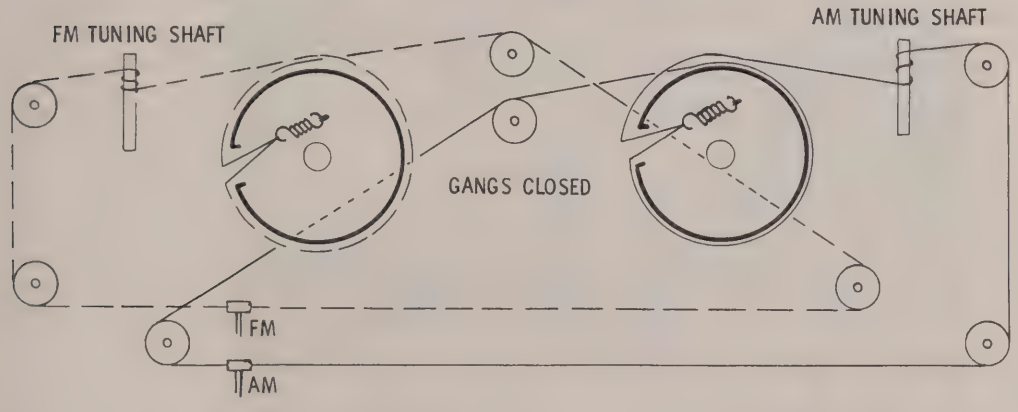
# PILOT
# MODEL FA-680

PILOT
MODEL FA-680

PILOT
MODEL FA-680

| | | | |
|---|---|---|---|
| TRADE NAME | Pilot Model FA-680 | | |
| MANUFACTURER | Pilot Radio Corp., 37-06 36th Street, Long Island City 1, N. Y. | | |
| TYPE SET | AC Operated 15 Tube FM-AM Tuner | | |
| POWER SUPPLY | 105-120 Volts AC, 60 Cycles | RATING | 72 Watts, .71 Amp. @ 117 Volts AC (AM) |
| TUNING RANGES | BROADCAST 535 - 1720KC | FREQ. MOD. | 88 - 108MC |

## DIAL CORD STRINGING

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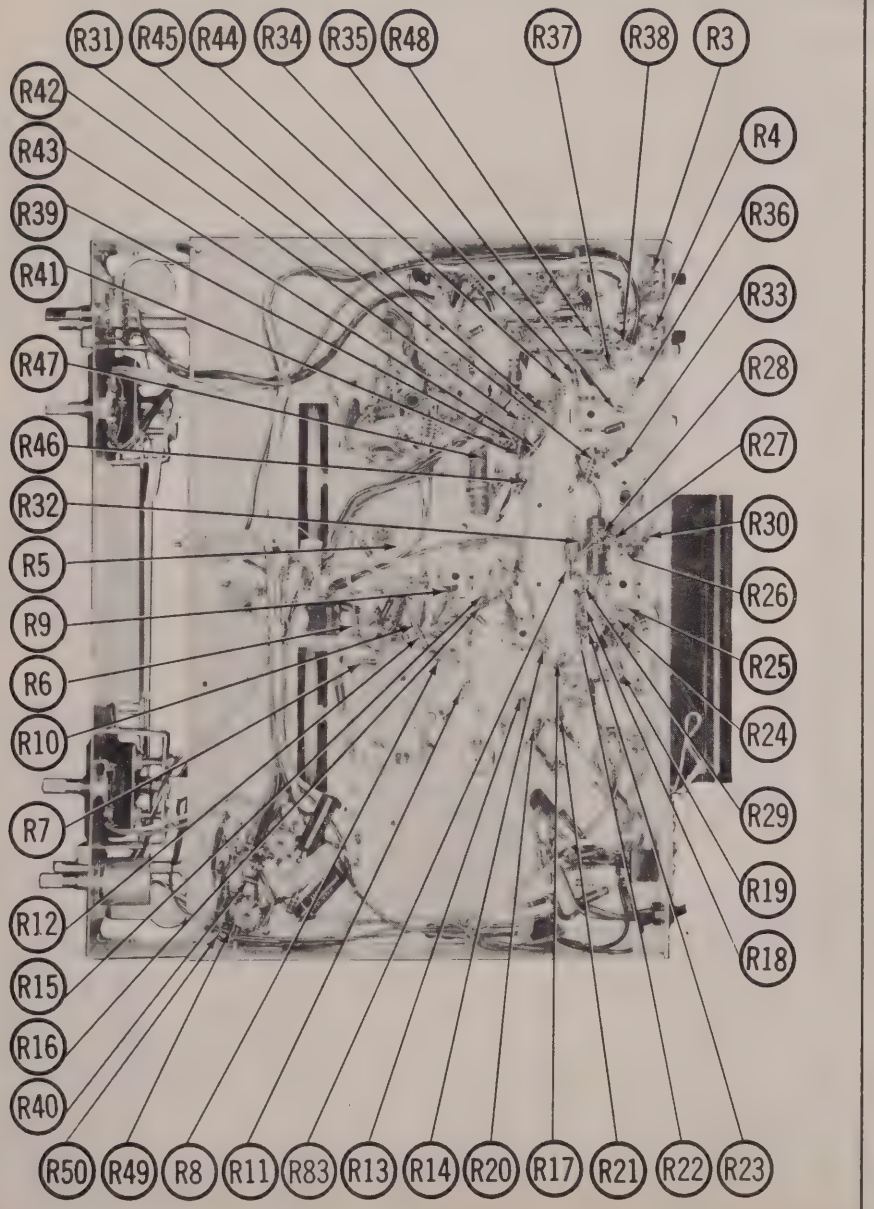
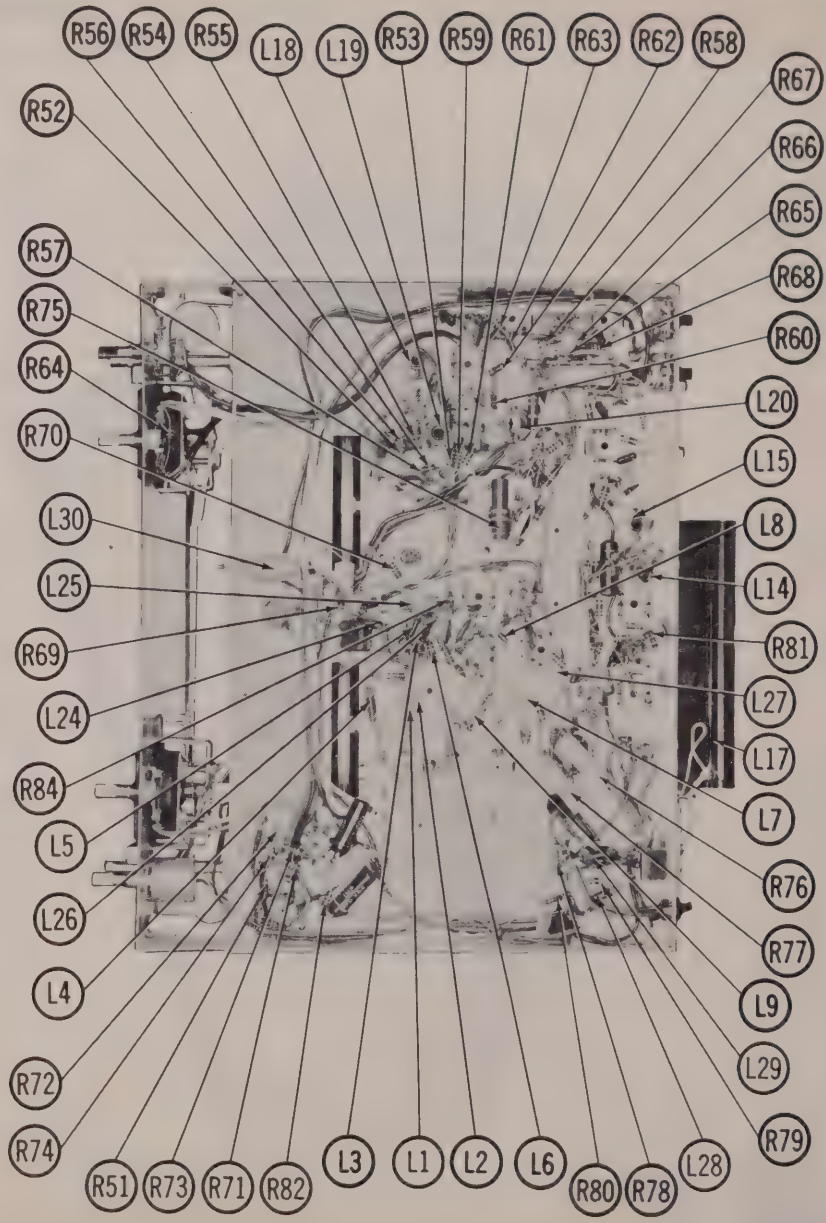
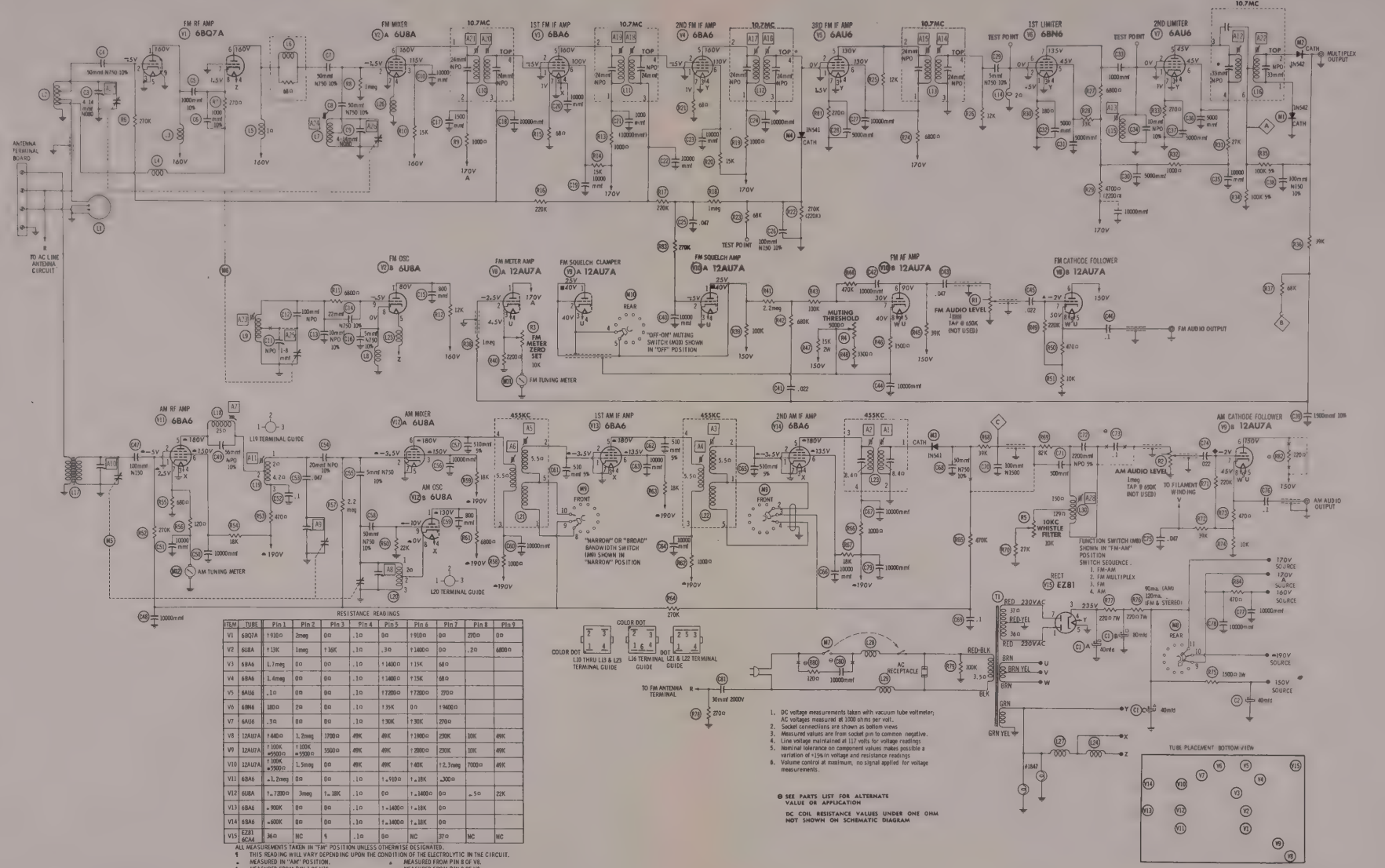
SET 476 FOLDER 10




CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION




CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENT




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BQ7A | †910Ω | 2meg | 0Ω | .1Ω | 0Ω | †910Ω | 0Ω | 270Ω | 0Ω |
| V2 | 6U8A | †13K | 1meg | †16K | .1Ω | .3Ω | †1400Ω | 0Ω | .2Ω | 6800Ω |
| V3 | 6BA6 | 1.7meg | 0Ω | 0Ω | .1Ω | †1400Ω | †15K | 68Ω | | |
| V4 | 6BA6 | 1.4meg | 0Ω | 0Ω | .1Ω | †1400Ω | †15K | 68Ω | | |
| V5 | 6AU6 | .1Ω | 0Ω | 0Ω | .1Ω | †7200Ω | †7300Ω | 270Ω | | |
| V6 | 6BN6 | 180Ω | 2Ω | 0Ω | .1Ω | †35K | 0Ω | †9400Ω | | |
| V7 | 6AU6 | .3Ω | 0Ω | 0Ω | .1Ω | †30K | †30K | 270Ω | | |
| V8 | 12AU7A | †640Ω | 1.2meg | 1700Ω | 49K | 49K | †1900Ω | 230K | 10K | 49K |
| V9 | 12AU7A | †100K ⁋9500Ω | †100K ⁋5500Ω | 5500Ω | 49K | 49K | †2800Ω | 230K | 10K | 49K |
| V10 | 12AU7A | †100K ⁋7500Ω | 1.5meg | 0Ω | 49K | 49K | †40K | †2.3meg | 7000Ω | 49K |
| V11 | 6BA6 | ⁎1.2meg | 0Ω | 0Ω | .1Ω | ⁎1.910Ω | ⁎1.18K | .300Ω | | |
| V12 | 6U8A | ⁎1.7280Ω | 3meg | ⁎1.18K | .1Ω | 0Ω | ⁎1.1400Ω | 0Ω | ⁎.5Ω | 22K |
| V13 | 6BA6 | ⁎.900K | 0Ω | 0Ω | .1Ω | ⁎1.1400Ω | ⁎1.18K | 0Ω | | |
| V14 | 6BA6 | ⁎.600K | 0Ω | 0Ω | .1Ω | ⁎1.1400Ω | ⁎1.18K | 0Ω | | |
| V15 | EZ81 6CA4 | 36Ω | NC | § | .1Ω | 0Ω | NC | 37Ω | NC | NC |

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
§ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
⁎ MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 3 OF V15.
▪ MUTING SWITCH IN "OFF" POSITION.
▲ MEASURED FROM PIN 8 OF V8.
◆ MEASURED FROM PIN 8 OF V9.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ⁋15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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PILOT
MODEL FA-680

# ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Level Control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

| | |
|---|---|
| A1 thru A6, A12, A14 thru A22 ..... | GENERAL CEMENT #5097, 8727<br>WALSCO #2515 |
| A7, A11 ..... | GENERAL CEMENT #8282, 8606, 8606L, 9295<br>WALSCO #2526, 2543, 2544, 2545 |
| A8 thru A10, A25 thru A27 ..... | GENERAL CEMENT #5004, 5008, 5009<br>WALSCO #2520 |
| A23, A24 ..... | GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003<br>WALSCO #2516, 2519 |

AM ALIGNMENT

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | High side thru .1mfd to RF stator lug of AM tuning gang. Low side to chassis. | 455KC (400~ Mod.) | AM | Tuning gang fully closed | AC probe to AM Audio Output Jack. Common to chassis. | A1, A2, A3, A4, A5, A6 | Adjust for maximum deflection. |
| 2. | High side to AM antenna term. Low side to chassis. | " | " | " | " | A7 | Adjust for MINIMUM deflection. |
| 3. | " | 1500KC | " | 1500KC | " | A8, A9, A10 | Adjust for maximum deflection. |
| 4. | " | 600KC | " | 600KC | " | A11 | Adjust for maximum deflection. Repeat steps 3 and 4. |

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 5. | High side thru .01mfd to FM RF stator lug of tuning gang. Low side to chassis. | 10.7MC (Unmod.) | FM | 88MC | DC probe thru 1meg to point Ⓐ. Common to chassis. | A12, A13, A14, A15, A16, A17, A18, A19, A20, A21 | Adjust for maximum deflection. |
| 6. | " | " | " | " | DC probe to point Ⓑ. Common to chassis. | A22 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 5. | High side thru .01mfd to FM RF stator lug of tuning gang. Low side to chassis. | 10.7MC (450KC swp.) | FM | 88MC | Vert. Amp. thru 100K to point Ⓐ. Low side to chassis. | A12, A13, A14, A15, A16, A17, A18, A19, A20, A21 | Adjust for maximum gain and symmetry of response similar to Fig. 1. |
| 6. | " | " | " | " | Vert. Amp. to point Ⓑ. Low side to chassis. | A22 | Adjust to place marker at the center of of crossover lines similar to Fig. 2. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines. |

FM RF ALIGNMENT

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 7. | High side thru 270Ω to D2 antenna terminal. Low side to chassis. | 90MC (Unmod.) | FM | 90MC | DC probe thru 1meg to point Ⓐ. Common to chassis. | A23, A24 | Adjust for maximum deflection. |
| 8. | " | 106MC | " | 106MC | " | A25, A26, A27 | Adjust for maximum deflection. Repeat steps 7 and 8. |

10KC FILTER ALIGNMENT - SELECTOR IN AM POSITION

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 9. | High side to point Ⓒ. Low side to chassis. | 10KC (400~ Mod.) | AM | AM tuning gang fully open | Vert. Amp. to AM Audio Output Jack. Low side to chassis. | A28, R5 | Adjust for MINIMUM amplitude. |

FIG. 1

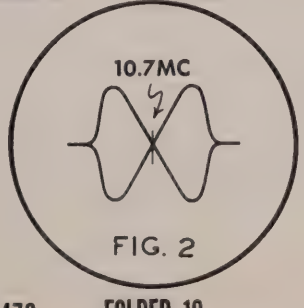
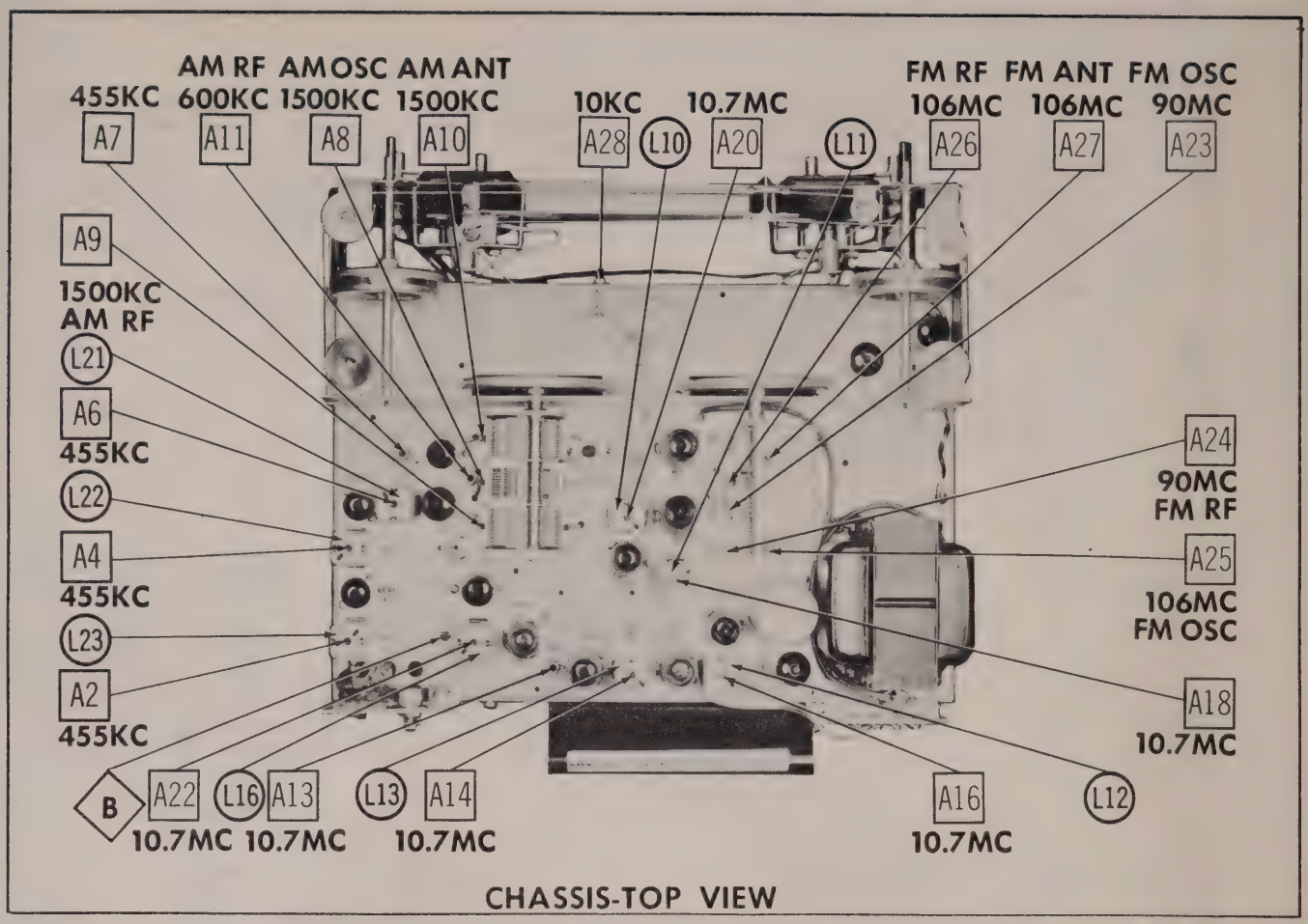
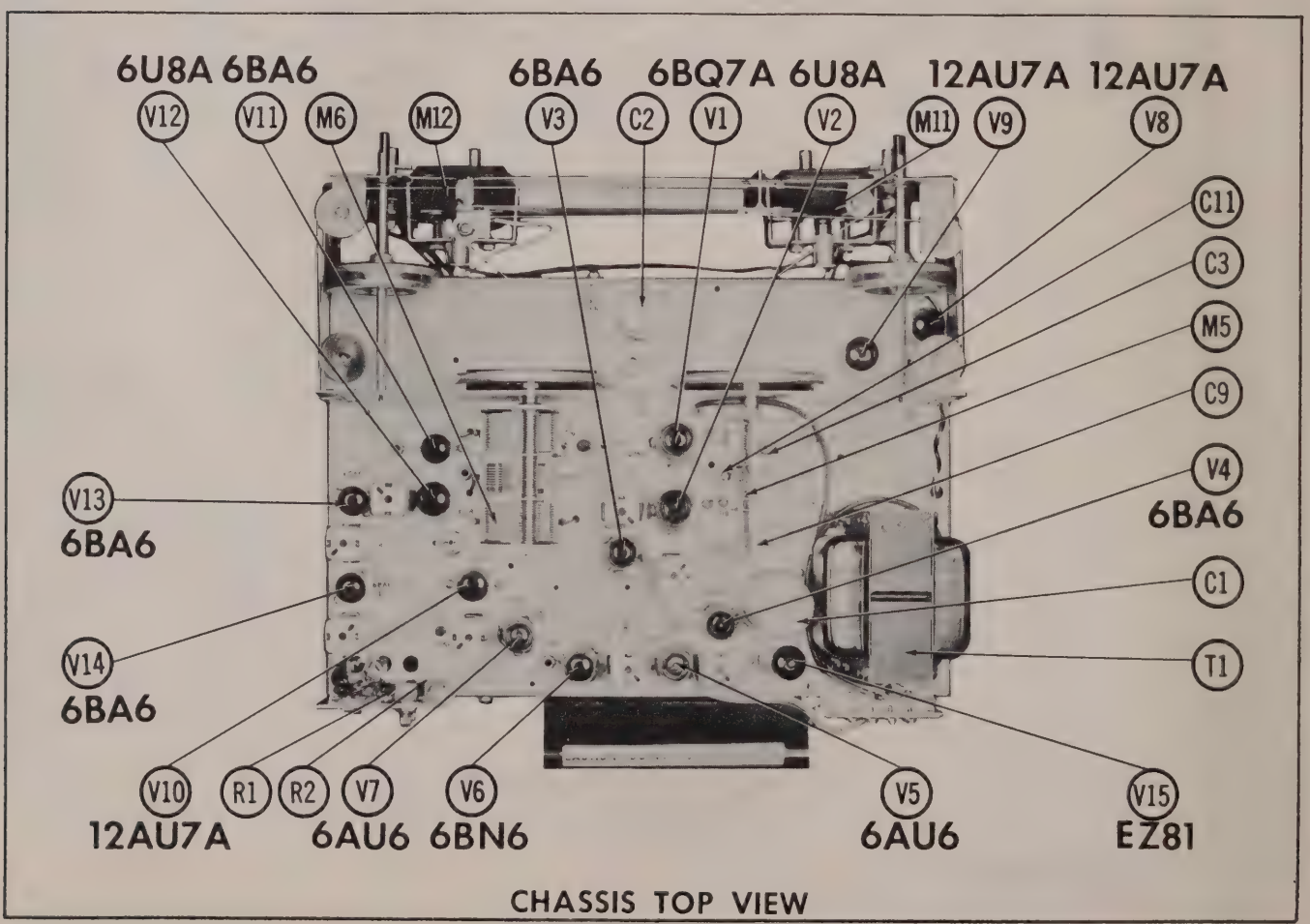


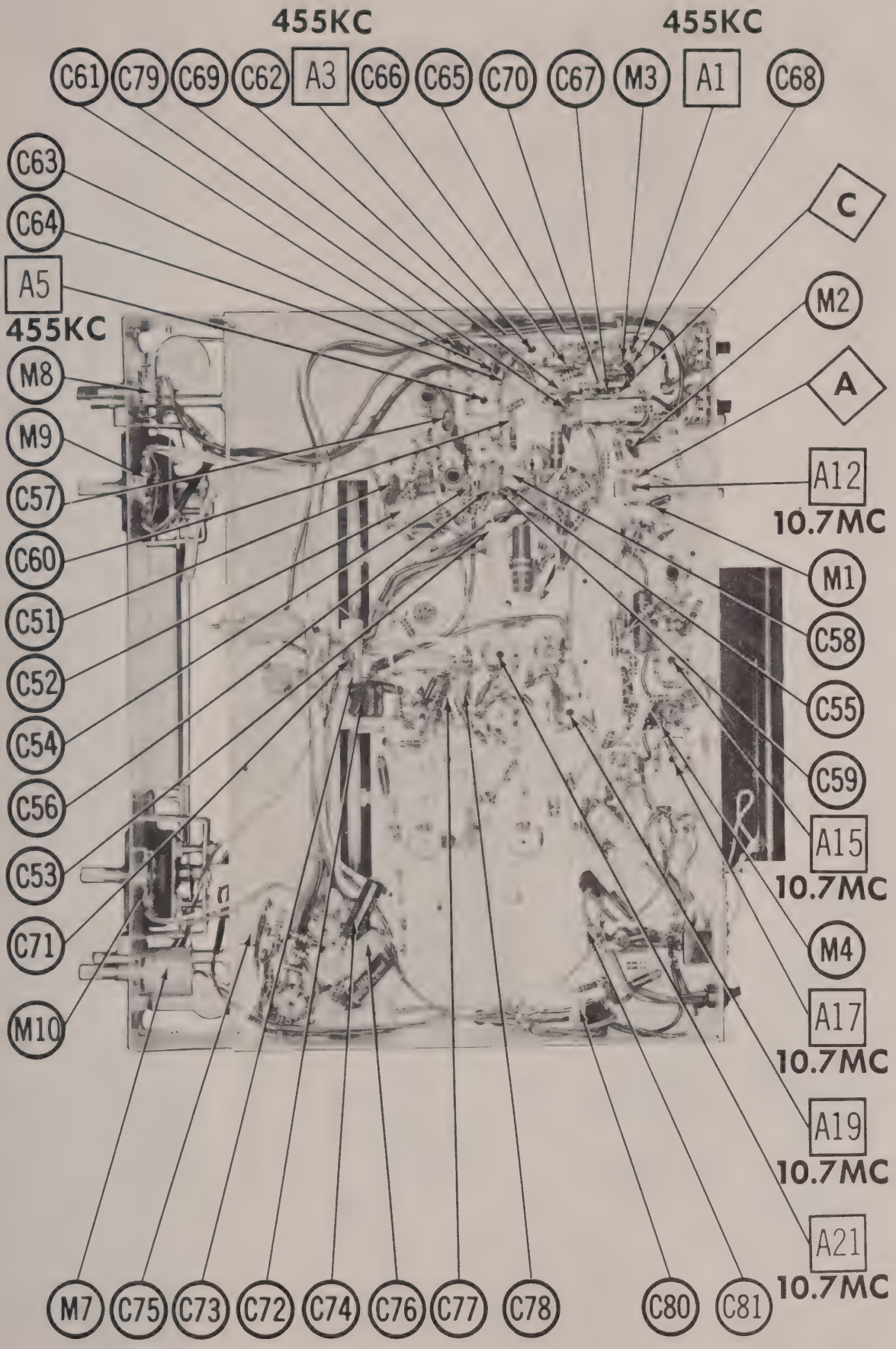
FIG. 2




CHASSIS-TOP VIEW




CHASSIS TOP VIEW




CHASSIS BOTTOM VIEW – ALIGNMENT, CAPACITOR & MISC. IDENT.

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
|---|---|---|---|---|---|
| V1 | FM RF Amplifier | 6BQ7A | V9 | FM Squelch Clamp - AM Cathode Follower | 12AU7A |
| V2 | FM Mixer - Osc. | 6U8A | V10 | FM Squelch Amplifier - FM AF Amplifier | 12AU7A |
| V3 | 1st FM IF Amplifier | 6BA6 | V11 | AM RF Amplifier | 6BA6 |
| V4 | 2nd FM IF Amplifier | 6BA6 | V12 | AM Mixer - Osc. | 6U8A |
| V5 | 3rd FM IF Amplifier | 6AU6 | V13 | 1st AM IF Amplifier | 6BA6 |
| V6 | 1st FM Limiter | 6BN6 | V14 | 2nd AM IF Amplifier | 6BA6 |
| V7 | 2nd FM Limiter | 6AU6 | V15 | Rectifier | EZ81/6CA4 |
| V8 | FM Meter Amplifier - FM Cathode Follower | 12AU7A | | | |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA PILOT PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ●40 | 300 | 24-123 | AFH3-25-50 | C0194 | FP227.5 | TMD-38 | TVL-3583 | |
| B | ■80 | 250 | | | | TC58 | TD-80-350 | | |
| C | ▲40 | 250 | | | | | | | |
| C2 | 40 | 250 | 24-176 | AFH1-29 | XA0291 | FP146 | TMS-31 | TVL-1519 | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| C3 | 4-14 | N080 | | | | | | | | |
| C4 | 50 | N750 | 10% | | N750-DI 47 | TCN-50 | C10Q5U | CCTN-500 | CN7-447 | 10TCU-Q47 |
| C5 | 1000 | | 10% | | DI-1000 | DD-102 | 1R5D1 | CCD-102 | GP210 | 10TS-D10 |
| C6 | 1000 | | 10% | | DI-1000 | DD-102 | 1R5D1 | CCD-102 | GP210 | 10TS-D10 |
| C7 | 50 | N750 | 10% | | N750-DI 47 | TCN-50 | C10Q5U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C8 | 50 | N750 | 10% | | N750-DI 47 | TCN-50 | C10Q5U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C9 | 4-14 | N080 | | | | | | | | |
| C10 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C11 | 1-8 | NPO | | | | | | | | |
| C12 | 100 | NPO | | | NPO-SI 100 | TCZ-100 | C10T1C | CCTO-101 | CNO-310 | 10TCC-T10 |
| C13 | 10 | NPO | 10% | | NPO-DI 10 | DTZ-10 | C10Q1C | CCTO-100 | CNO-410 | 10TCC-Q10 |
| C14 | 22 | N750 | 10% | | N750-DI 22 | DTN-22 | C10Q22U | CCTN-220 | CN7-422 | 10TCU-Q22 |
| C15 | 800 | | | | BPD-0008 | DD-801 | L10T8 | CCD-821 | B-382 | 5GA-T80 |
| C16 | 5 | N750 | 10% | | | DTN-5 | C10V5U | CCTN-050 | CN7-550 | 10TCU-V5 |
| C17 | 1500 | | | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | B-215 | 5HK-D15 |
| C18 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C19 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C20 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C21 | 1000 | | | (10000mmf) † | BPD-001 | DD-102 | BYA10D1 | CCD-102 | B-210 | 5HK-D10 |
| C22 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |

## FIXED CAPACITORS (cont)

| ITEM No. | RATING | | | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| C23 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C24 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C25 | .047 | 200V | | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C26 | 100 | N150 | 10% | | | | | * | | 10TCP-T10 |
| C27 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C28 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | B-250 | 5HK-D50 |
| C29 | 5 | N750 | 10% | | | DTN-5 | C10V5U | CCTN-050 | CN7-550 | 10TCU-V5 |
| C30 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | B-250 | 5HK-D50 |
| C31 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | B-250 | 5HK-D50 |
| C32 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | B-250 | 5HK-D50 |
| C33 | 1000 | | | | BPD-001 | DD-102 | BYA10D1 | CCD-102 | B-210 | 5HK-D10 |
| C34 | 10 | NPO | 10% | | NPO-DI 10 | DTZ-10 | C10Q1C | CCTO-100 | CNO-410 | 10TCC-Q10 |
| C35 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C36 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | B-250 | 5HK-D50 |
| C37 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | B-250 | 5HK-D50 |
| C38 | 100 | N150 | 10% | | | | | * | | 10TCP-T10 |
| C39 | 1500 | | 10% | | DI-1500 | DD-152 | PM6D15 | CCD-152 | GP215 | 10TS-D15 |
| C40 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C41 | .022 | 400V | | | P488N-022 | DD-203 | CUB4S22 | 4DP-2-223 | GEM-4122 | 4TM-S22 |
| C42 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C43 | .047 | 400V | | | P488N-047 | DD-503 | CUB4S47 | 4DP-3-473 | GEM-4147 | 4TM-S47 |
| C44 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S1 |
| C45 | .022 | 400V | | | P488N-022 | DD-203 | CUB4S22 | 4DP-2-223 | GEM-4122 | 4TM-S22 |
| C46 | .1 | 200V | | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |
| C47 | 100 | N150 | | | | | | * | | 10TCP-T10 |
| C48 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C49 | 56 | NPO | 10% | | | TCZ-56 | C10Q56C | CCTO-560 | CNO-456 | 10TCC-Q56 |
| C50 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C51 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C52 | .1 | 400V | | | P488N-1 | DF-104 | CUB4P1 | 4DP-3-104 | GEM-401 | 4TM-P1 |
| C53 | .047 | 400V | | | P488N-047 | DD-503 | CUB4S47 | 4DP-3-473 | GEM-4147 | 4TM-S47 |
| C54 | 20 | NPO | 10% | | NPO-DI 20 | DTZ-20 | C10Q2C | CCTO-200 | CNO-422 | 10TCC-Q20 |
| C55 | 5 | N750 | 10% | | | DTN-5 | C10V5U | CCTN-050 | CN7-550 | 10TCU-V5 |
| C56 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C57 | 510 | | 5% | | 1469-00051 | | 22R5T51 | CM-20B-511J | MCE245 | MS-351 |
| C58 | 50 | N750 | 10% | | N750-DI 47 | TCN-50 | C10Q5U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C59 | 800 | | | | BPD-0008 | DD-801 | L10T8 | CCD-821 | B-382 | 5GA-T80 |
| C60 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C61 | 510 | | 5% | | 1469-00051 | | 22R5T51 | CM-20B-511J | MCE245 | MS-351 |
| C62 | 510 | | 5% | | 1469-00051 | | 22R5T51 | CM-20B-511J | MCE245 | MS-351 |
| C63 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C64 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C65 | 510 | | 5% | | 1469-00051 | | 22R5T51 | CM-20B-511J | MCE245 | MS-351 |
| C66 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C67 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C68 | 50 | N750 | 10% | | N750-DI 47 | TCN-50 | C10Q50U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C69 | .1 | 200V | | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |
| C70 | 100 | N1500 | | | | TCL-100 | | * | | |
| C71 | 500 | | | | BPD-0005 | DD-501 | BYA10T5 | CCD-501 | B-350 | 5GA-T50 |

# PARTS LIST AND DESCRIPTIONS (Continued)

## FIXED CAPACITORS (cont)

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C72 | 2200 NPO 5% | | | | | | | |
| C73 | .1 200V | Note 1 | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |
| C74 | .022 400V | | P488N-022 | DD-203 | CUB4S22 | 4DP-2-223 | GEM-4122 | 4TM-S22 |
| C75 | .047 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C76 | .1 200V | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |
| C77 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C78 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C79 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C80 | 10000 | Note 1 | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C81 | 30 2000V | | HVD-30-33 | DD30-300 | HVA20Q33 | VCM-20-300M | 2DY-433 | 30GA-Q30 |

† Alternate Value. Note 1. Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | PILOT PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 1meg * | ½ | 39-41 | ABT-74 | A47F5-1meg | Q19-137X | RU16T654 † | FM Audio Level |
| B | Shaft | | | AK-1 | FKS-1/4 | Not Req. | SL3500 | |
| R2A | 1meg * | ½ | 39-41 | ABT-74 | A47F5-1meg | Q19-137X | RU16T654 † | AM Audio Level |
| B | Shaft | | | AK-1 | FKS-1/4 | Not Req. | SL3500 | |
| R3A | 10K | ½ | 39-46 | AB-14 | B47-10K-S | B11-116 | SU-20 | FM Meter Zero Set |
| B | Shaft | | | AK-1 | Not Req. | TM4 | Not Req. | |
| R4A | 5000Ω | ½ | 39-42 | BX-10 | B47-5000-S | B11-114 | SU-14 | Muting Threshold |
| B | Shaft | | | Not Req. | Not Req. | TM4 | Not Req. | |
| R5A | 10K | ½ | 39-46 | AB-14 | B47-10K-S | B11-116 | SU-20 | 10KC Whistle Filter |
| B | Shaft | | | AK-1 | Not Req. | TM4 | Not Req. | |

* Tap ⑨ 650K (Not Used). † Use SL38 Bushing.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R6 | 270K | |
| R7 | 270Ω | |
| R8 | 1meg | |
| R9 | 1000Ω | |
| R10 | 15K | |
| R11 | 6800Ω | |
| R12 | 12K | |
| R13 | 1000Ω | |
| R14 | 15K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R15 | 68Ω | |
| R16 | 220K | |
| R17 | 220K | |
| R18 | 1meg | |
| R19 | 1000Ω | |
| R20 | 15K | |
| R21 | 68Ω | |
| R22 | 270K | (220K) * |
| R23 | 68K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R24 | 6800Ω | |
| R25 | 12K | |
| R26 | 12K | |
| R27 | 6800Ω | |
| R28 | 33K | |
| R29 | 4700Ω | (2200Ω) * |
| R30 | 180Ω | |
| R31 | 27K | |
| R32 | 1000Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R33 | 270Ω | |
| R34 | 100K 5% | |
| R35 | 100K 5% | |
| R36 | 39K | |
| R37 | 68K | |
| R38 | 1meg | |
| R39 | 100K | |
| R40 | 2200Ω | |
| R41 | 2.2meg | |
| R42 | 680K | |
| R43 | 100K | |
| R44 | 470K | |
| R45 | 39K | |
| R46 | 1500Ω | |
| R47 | 15K 2W | |
| R48 | 3300Ω | |
| R49 | 220K | |
| R50 | 470Ω | |

## RESISTORS (cont)

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R51 | 10K | |
| R52 | 270K | |
| R53 | 470Ω | |
| R54 | 18K | |
| R55 | 680Ω | |
| R56 | 120Ω | |
| R57 | 2.2meg | |
| R58 | 1000Ω | |
| R59 | 18K | |
| R60 | 22K | |
| R61 | 6800Ω | |
| R62 | 1000Ω | |
| R63 | 18K | |
| R64 | 270K | |
| R65 | 470K | |
| R66 | 1000Ω | |
| R67 | 18K | |
| R68 | 39K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R69 | 82K | |
| R70 | 27K | |
| R71 | 220K | |
| R72 | 39K | |
| R73 | 470Ω | |
| R74 | 10K | |
| R75 | 1500Ω 1W | |
| R76 | 220Ω 7W | |
| R77 | 220Ω 7W | |
| R78 | 270Ω | |
| R79 | 100K | |
| R80 | 120Ω | Note 1 |
| R81 | 270Ω | |
| R82 | 120Ω | Note 1 |
| R83 | 270K | |
| R84 | 470Ω | |

* Alternate Value. Note 1. Not used in some versions.

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | PILOT PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | FM Ant. Matching Coil | 70-85 | | | | | | |
| L2 | FM Antenna Coil | 70-84 | | | | | | |
| L3 | RF Choke | 75-52 | 19-2002 | 19-2002 | | 4582 | | .15uh |
| L4 | Cathode Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L5 | RF Choke | 75-33 | 19-1004 | 19-1004 | SW-631 | 4529 | | 5uh |
| L6 | RF Choke | | | | | | | ① |
| L7 | FM RF Coil | 71-46 | | | | | | |
| L8 | Cathode Choke | 75-33 | 19-1004 | 19-1004 | SW-631 | 4529 | | 5uh |
| L9 | FM Osc. Coil | 72-81 | | | | | | |
| L10 | 1st FM IF | 273-151 | 16-3487 | 16-3487 | FM-254 | 1463 | | |
| L11 | 2nd FM IF | 273-151 | 16-3487 | 16-3487 | FM-254 | 1463 | | |
| L12 | 3rd FM IF | 273-151 | 16-3487 | 16-3487 | FM-254 | 1463 | | |
| L13 | 4th FM IF | 273-151 | 16-3487 | 16-3487 | FM-254 | 1463 | | |
| L14 | RF Choke | 75-51 | 19-3075 | 19-3075 | TV-186 | 6172 | VP-2 | 80uh |
| L15 | 5th FM IF | 273-154 | | | | | | |
| L16 | Discriminator | 279-78 | 17-3494 | 17-3494 | FM-253 | 1464 | | |
| L17 | Loopstick | 270-56 | | | | | | |
| L18 | 455KC Trap Coil | 79-102 | | | | | | |
| L19 | AM RF Coil | 71-43 | | | | | | |
| L20 | AM Osc. Coil | 72-78 | | | BC-393 | | | |
| L21 | 1st AM IF | 273-152 | | | | | | |
| L22 | 2nd AM IF | 273-152 | | | | | | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF) (cont)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | PILOT PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L23 | 3rd AM IF | 273-129 | 16-6758 | 16-6758 | BC-353 | 12-C2 | RF-2 | |
| L24 | Fil. Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L25 | Fil. Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L26 | Fil. Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L27 | Fil. Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L28 | Line Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L29 | Line Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L30 | 10KC Filter | 79-106 | | | | | | |

① 3 Turns wire on 330Ω resistor.

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | PILOT PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 117V ⓐ .77A | 460VCT ⓐ .120A | 6.3V ⓐ 3.7A | 55-71 | | | | | | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3V ⓐ .9A | | | | | | | | | |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|
| | | PILOT PART No. | CBS PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| M1 | 1N542 | | 1N60 | 1N295 | 1N295 | Discriminator Matched |
| M2 | 1N542 | | 1N60 | 1N295 | 1N295 | Discriminator Pair |
| M3 | 1N541 | | 1N60 | 1N295 | 1N295 | AM Detector |
| M4 | 1N541 | | 1N60 | 1N295 | 1N295 | AGC Rectifier |

## MISCELLANEOUS

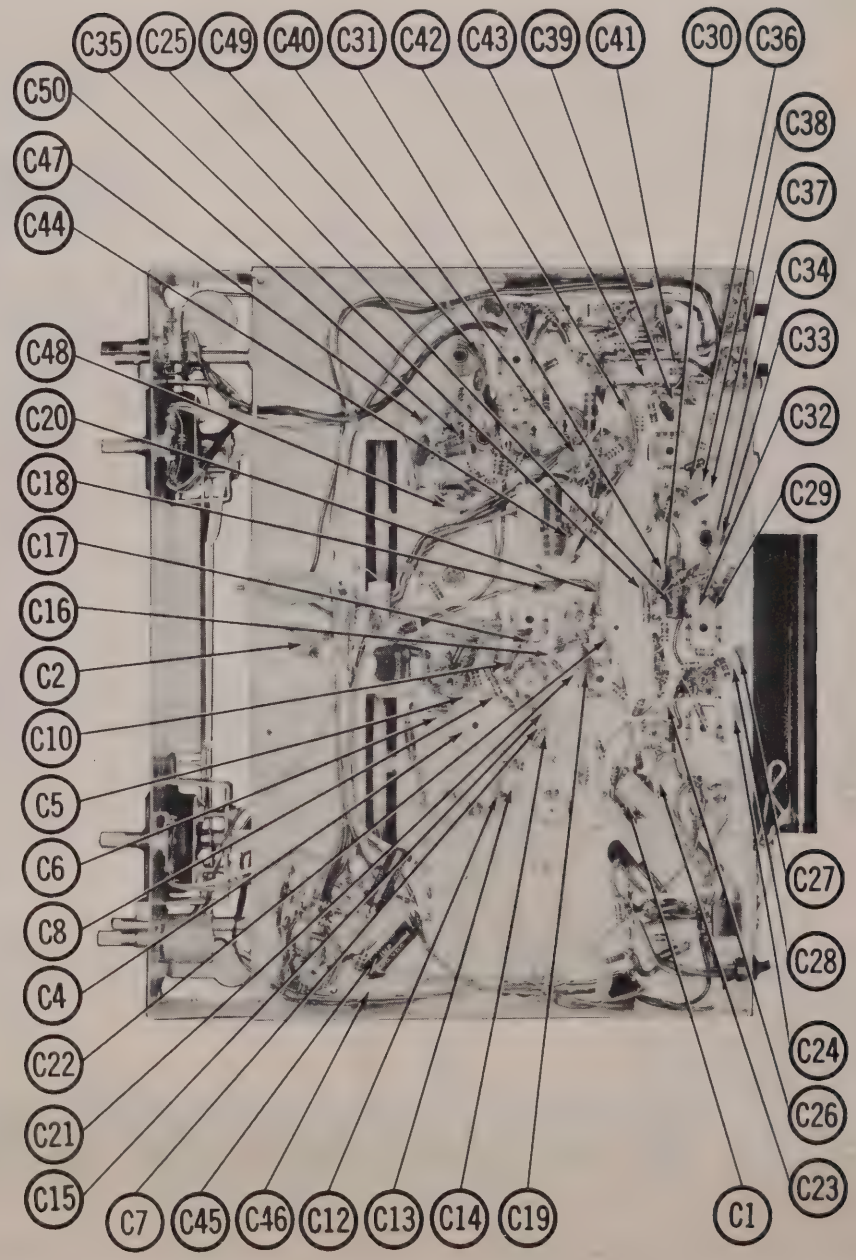
| ITEM No. | PART NAME | PILOT PART No. | NOTES |
|---|---|---|---|
| M5 | Tuning Cap. | 26-62 | AM, 3 Gang (Ant. 8-508mmf, RF 8-508mmf, Osc. 7-135mmf) |
| M6 | Tuning Cap. | 26-63 | FM, 3 Gang |
| M7 | Switch | 100-139 | Power On-Off |
| M8 | Switch | 100-145 | Function Selector |
| M9 | Switch | 100-144 | AM Bandwidth |
| M10 | Switch | 100-137 | Muting |
| M11 | Meter | 110-582 | FM Tuning |
| M12 | Meter | 110-582 | AM Tuning |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

## CHASSIS—BOTTOM VIEW



PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

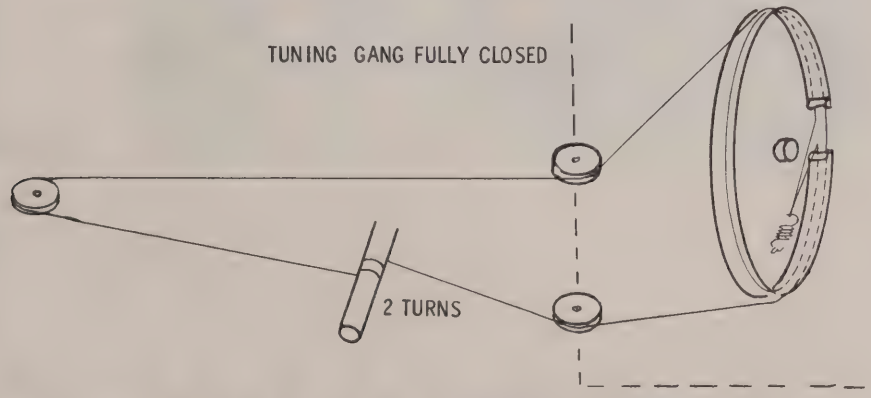
# PILOT
# MODEL FM-660

PILOT
MODEL FM-660

PILOT
MODEL FM-660

| | |
|---|---|
| TRADE NAME | Pilot Model FM-660 |
| MANUFACTURER | Pilot Radio Corp., 37-06 36th Street, Long Island City 1, N. Y. |
| TYPE SET | AC Operated 10 Tube FM Tuner |
| POWER SUPPLY | 105 - 120 Volts AC, 60 Cycles RATING 60 Watts, .56 Amp. @117 Volts AC |
| TUNING RANGE | 88-108MC |

## DIAL CORD STRINGING




**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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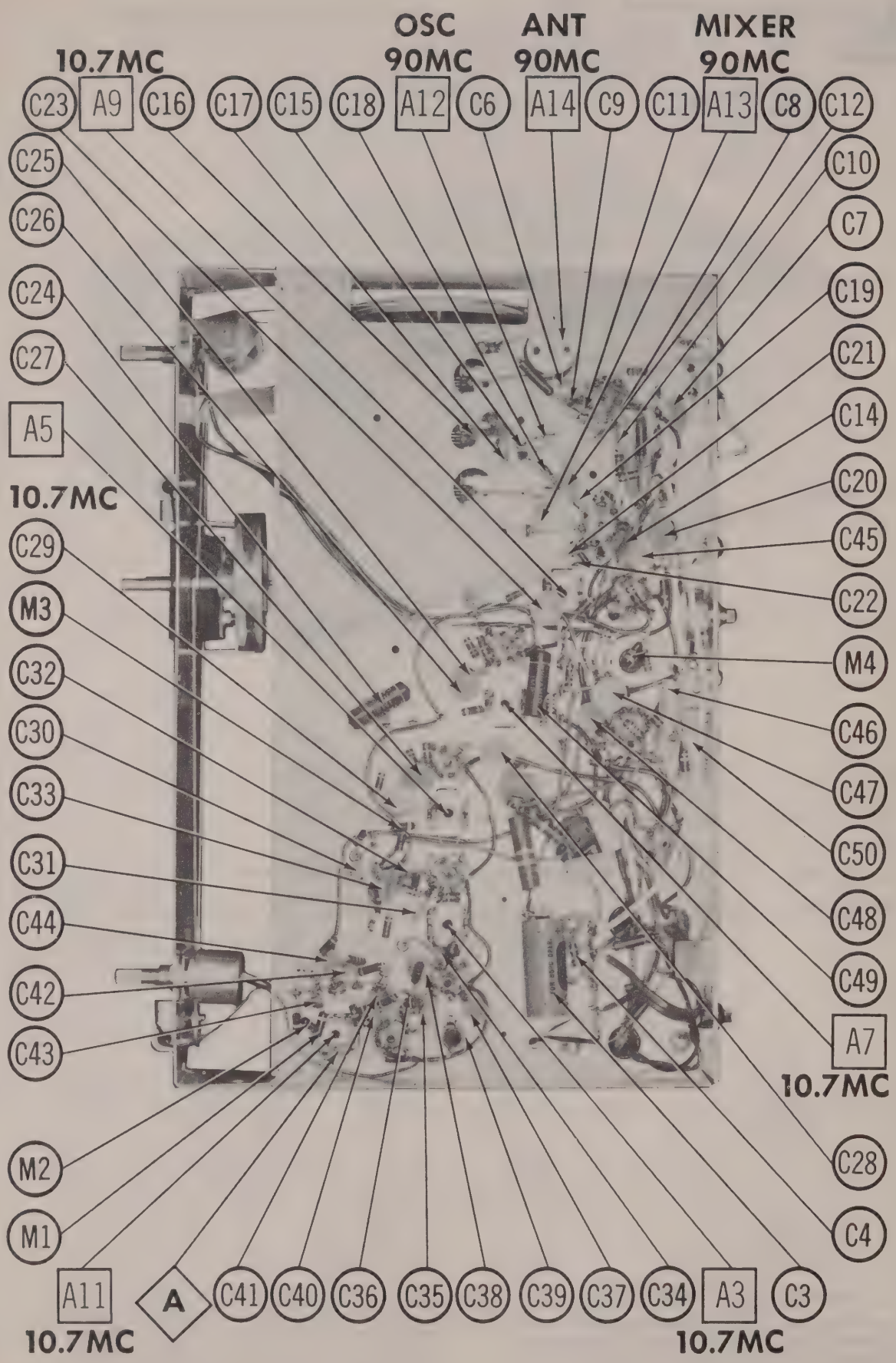
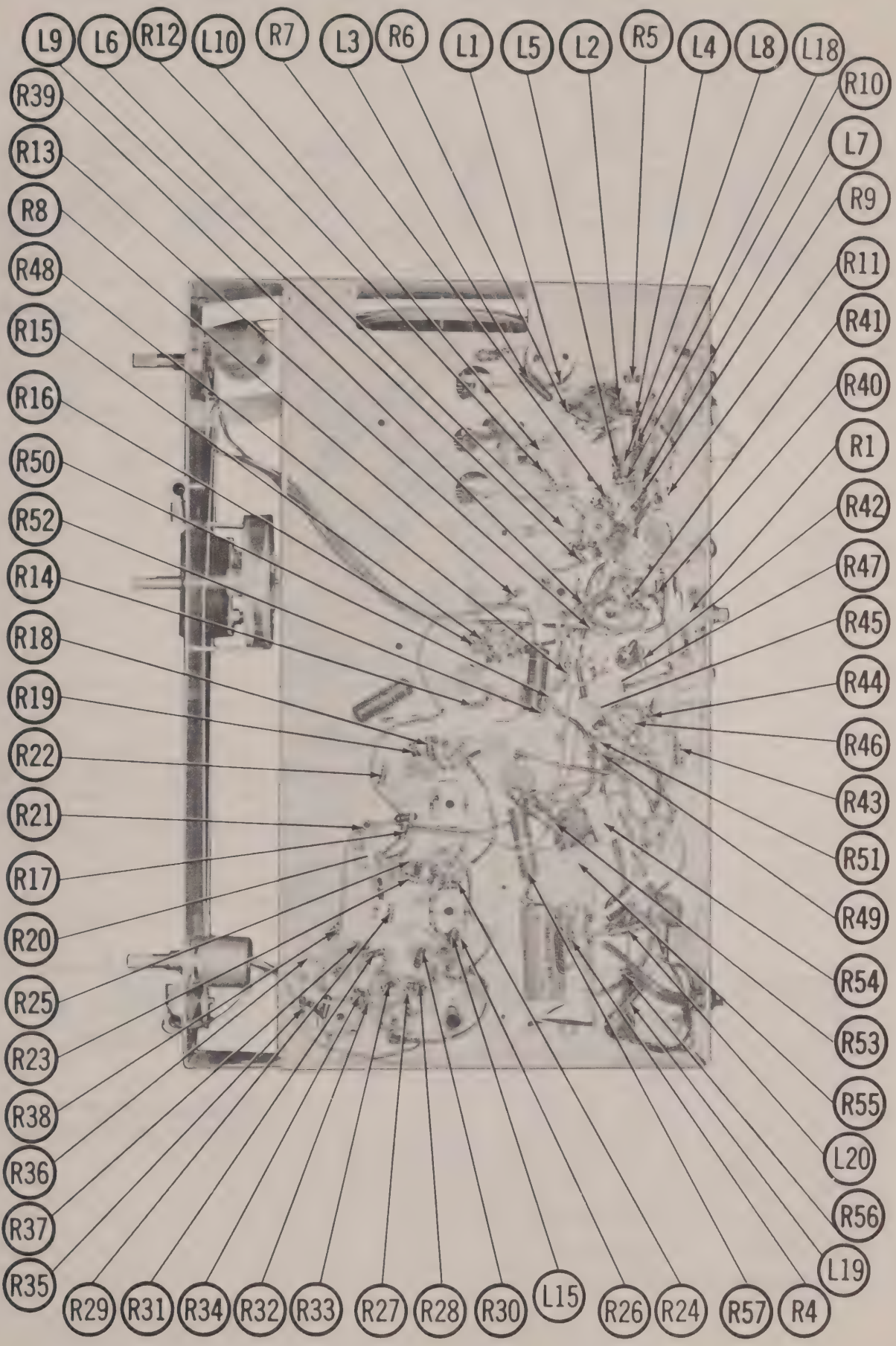
JJ469



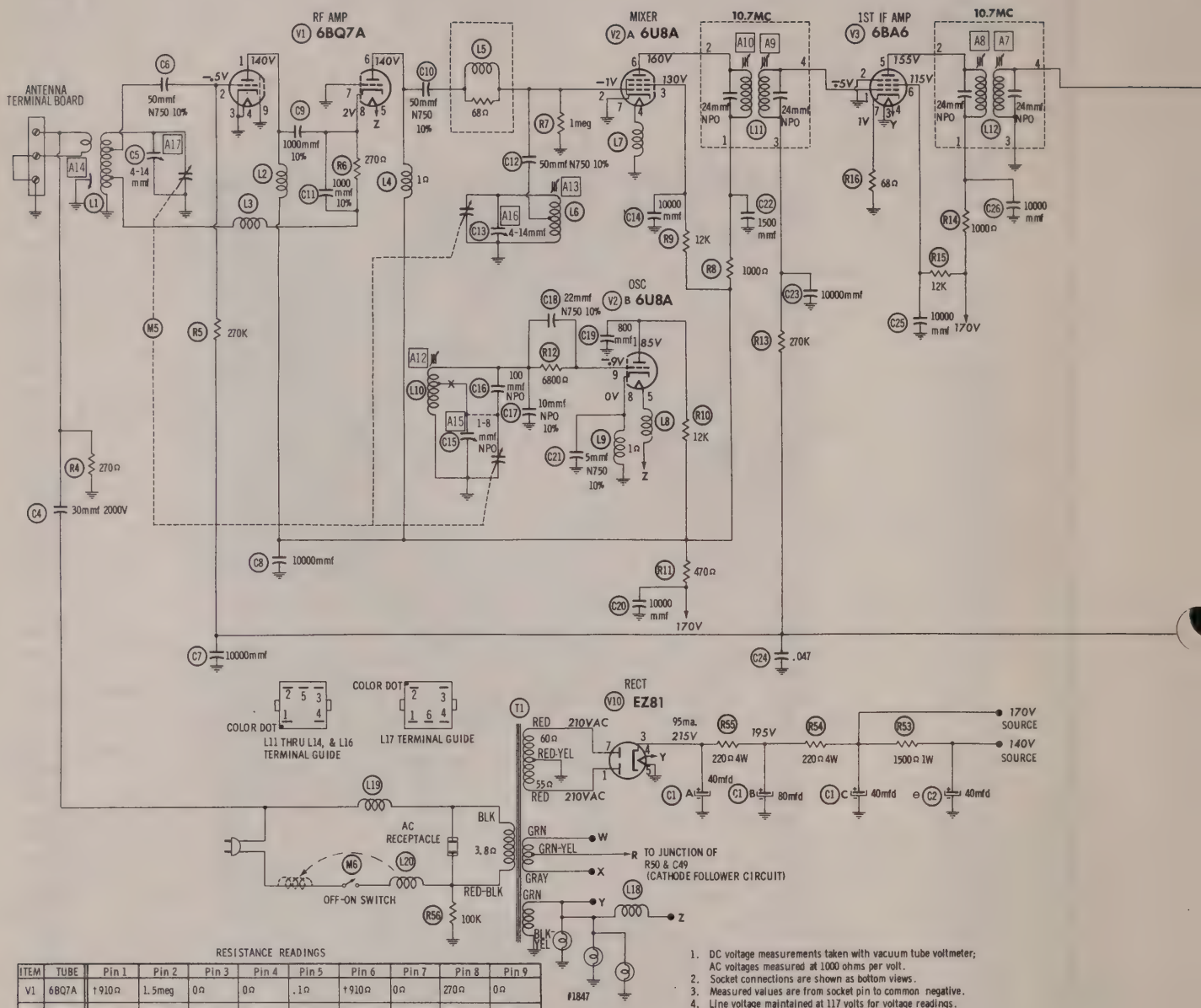
SET 476 FOLDER 11




CHASSIS BOTTOM VIEW – ALIGNMENT, CAPACITOR & MISC. IDENT.




CHASSIS BOTTOM VIEW – RESISTOR & INDUCTOR IDENT.




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BQ7A | †910Ω | 1.5meg | 0Ω | 0Ω | .1Ω | †910Ω | 0Ω | 270Ω | 0Ω |
| V2 | 6U8A | †13K | 1meg | †13K | .1Ω | .2Ω | †1900Ω | 0Ω | 1Ω | 6800Ω |
| V3 | 6BA6 | 1.5meg | 0Ω | 0Ω | .1Ω | †1400Ω | †12K | 68Ω | | |
| V4 | 6BA6 | .7Ω | 0Ω | 0Ω | .1Ω | †1400Ω | †12K | 68Ω | | |
| V5 | 6AU6A | .9Ω | 0Ω | 0Ω | .1Ω | †5100Ω | †5100Ω | 270Ω | | |
| V6 | 6BN6 | 180Ω | 2Ω | 0Ω | .1Ω | †35K | 0Ω | †9400Ω | | |
| V7 | 6AU6 | 1Ω | 0Ω | 0Ω | .1Ω | †30K | †30K | 270Ω | | |
| V8 | 12AU7A | †1900Ω | 1.2meg | 550Ω | 49K | 49K | †100K | 1.2meg | 0Ω | 49K |
| V9 | 12AU7A | †40K | †2.4meg | †18K | 49K | 49K | †1900Ω | 230K | 10K | 49K |
| V10 | EZ81 6CA4 | 55Ω | NC | ¶ | .1Ω | 0Ω | NC | 60Ω | NC | NC |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V10.
■ MEASURED FROM PIN 3 OF V9.
▲ MEASURED FROM PIN 8 OF V9.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

**DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM**

**ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)**

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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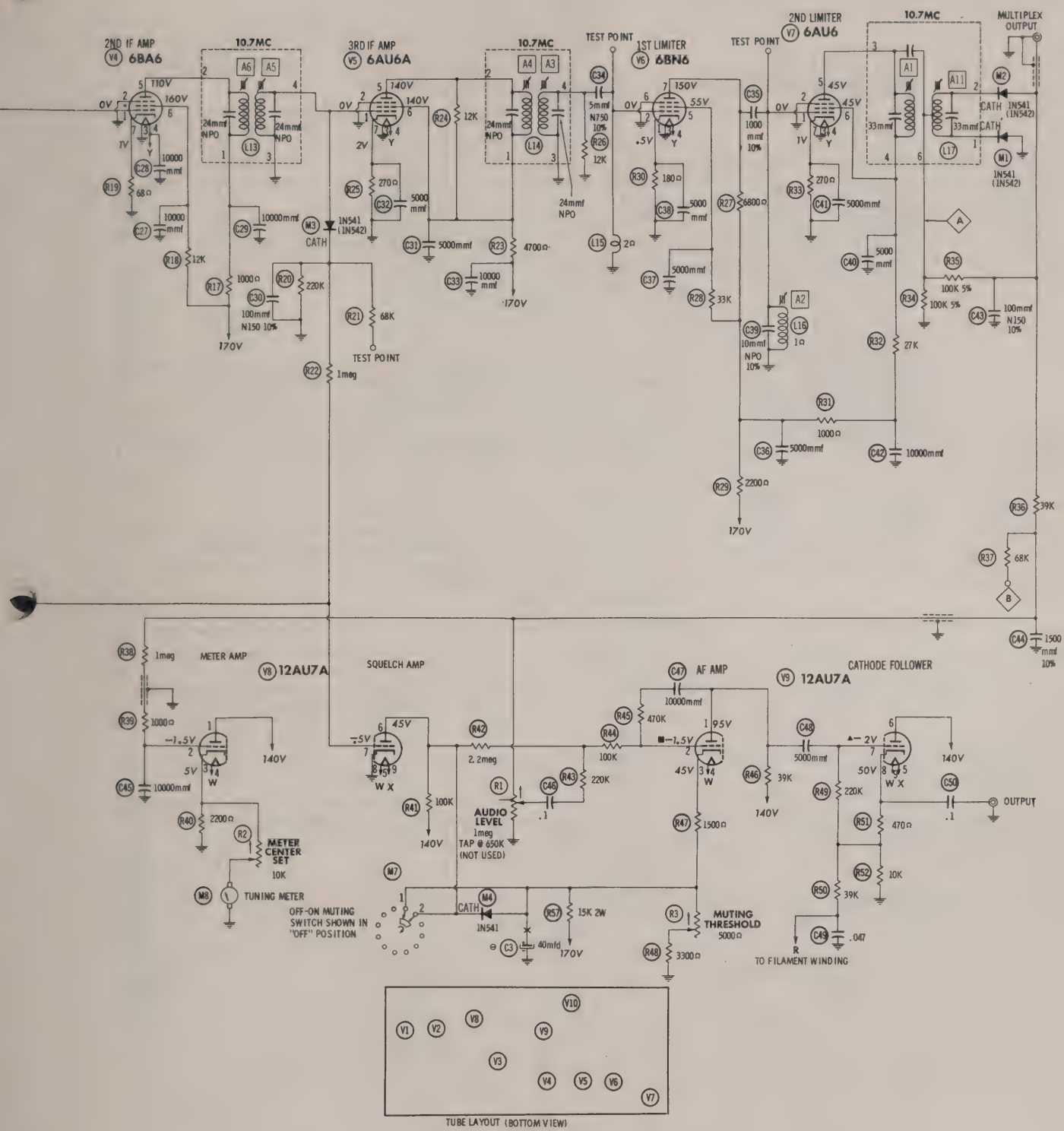



**PILOT**
**MODEL FM-660**

# ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

| | |
|---|---|
| A1, A3, thru A11..... | GENERAL CEMENT #5097, 8727<br>WALSCO #2515 |
| A2..... | GENERAL CEMENT #8606, 8606L, 8282, 9295<br>WALSCO #2526, 2543, 2544, 2545 |
| A12, A13..... | GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003<br>WALSCO #2516, 2519 |
| A15, A16, A17..... | GENERAL CEMENT #5004, 5008, 5009<br>WALSCO #2520 |

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | High side thru .01mfd to pin 2 (grid) of Mixer. Low side to chassis. | 10.7MC (Unmod.) | Point of non-interference. | DC probe thru 1meg to point (A). Common to chassis. | A1, A2, A3, A4, A5, A6, A7, A8, A9, A10 | Adjust for maximum deflection. |
| 2. | " | " | " | DC probe to point (B). Common to chassis. | A11 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | High side thru .01mfd to pin 2(grid) of Mixer. Low side to chassis. | 10.7MC (450KC Swp) | Point of non-interference. | Vert. Amp. thru 100K to point (A). Low side to chassis. | A1, A2, A3, A4, A5, A6, A7, A8, A9, A10 | Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. |
| 2. | " | " | " | Vert. Amp. to point (B). Low side to chassis. | A11 | Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines. |

RF ALIGNMENT

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 3. | High side thru 270Ω to antenna terminal D2. Low side to chassis. | 90MC (Unmod.) | 90MC | DC probe thru 100K to point (A). Common to chassis. | A12, A13, A14 | Adjust for maximum deflection. |
| 4. | " | 106MC | 106MC | " | A15, A16, A17 | " |

FIG. 1

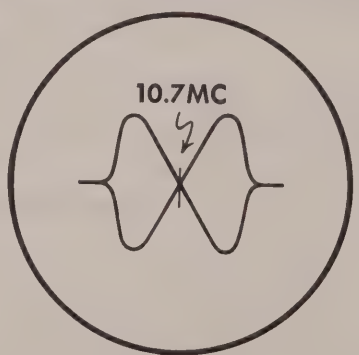



FIG. 2

# PARTS LIST AND DESCRIPTIONS

## TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

| ITEM No. | USE | TYPE |
|---|---|---|
| V1 | RF Amplifier | 6BQ7A |
| V2 | Mixer - Osc. | 6U8A |
| V3 | 1st IF Amplifier | 6BA6 |
| V4 | 2nd IF Amplifier | 6BA6 |
| V5 | 3rd IF Amplifier | 6AU6A |
| V6 | 1st Limiter | 6BN6 |
| V7 | 2nd Limiter | 6AU6 |
| V8 | Meter Amplifier - Squelch Amplifier | 12AU7A |
| V9 | AF Amplifier - Cathode Follower | 12AU7A |
| V10 | Rectifier | EZ81/6CA4 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA PILOT PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 40 | 300 | 24-123 | AFH3-25-50 | C0194 | FP227.5 | TMD-38 | TVL-3583 | |
| B | 80 | 250 | | | | TC58 | TD-80-350 | | |
| C | 40 | 250 | | | | | | | |
| C2 | 40 | 250 | 24-175 ① | AFH1-29 | XA0291 | FP146 | TMS-31 | TVL-1519 | |
| C3 | 40 | 150 | ② | PRS1470 | BR4015 | TC48 | TD-40-150 | TVA-1413 | |

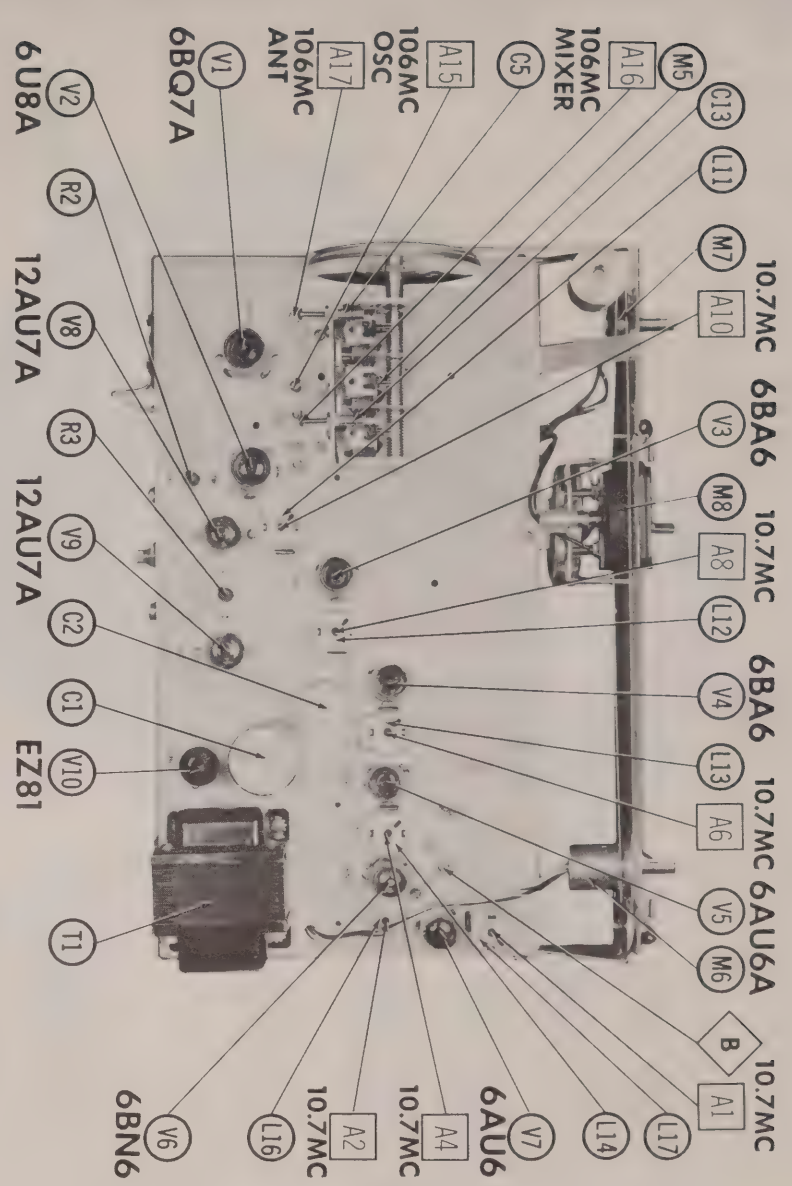
① Alternate Part #24-176. ② Not used in some versions.

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| C4 | 30 | 2000V | | | HVD-60-30 | DD30-300 | HVA20Q33 | VCM-20-300M | 2DY-433 | 30GA-Q30 |
| C5 | 4-14 | | | | | | | | | |
| C6 | 50 | N750 | 10% | | N750-DI 47 | TCN-50 | C10Q5U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C7 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C8 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C9 | 1000 | | 10% | | DI-1000 | DD-102 | 1R5D1 | CCD-102 | GP210 | 10TS-D10 |
| C10 | 50 | N750 | 10% | | N750-DI 47 | TCN-50 | C10Q5U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C11 | 1000 | | 10% | | DI-1000 | DD-102 | 1R5D1 | CCD-102 | GP210 | 10TS-D10 |
| C12 | 50 | N750 | 10% | | N750-DI 47 | TCN-50 | C10Q5U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C13 | 4-14 | | | | | | | | | |
| C14 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C15 | 1-8 | NPO | | | | | | | | |
| C16 | 100 | NPO | | | NPO-SI 100 | TCZ-100 | C10T1C | CCTO-101 | CNO-310 | 10TCC-T10 |
| C17 | 10 | NPO | 10% | | NPO-DI 10 | DTZ-10 | C10Q1C | CCTO-100 | CNO-410 | 10TCC-Q10 |
| C18 | 22 | N750 | 10% | | N750-DI 22 | DTN-22 | C10Q22U | CCTN-220 | CN7-422 | 10TCU-Q22 |
| C19 | 800 | | | | BPD-0008 | DD-801 | L10T8 | CCD-801 | GP382 | 10TS-T80 |
| C20 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C21 | 5 | N750 | 10% | | | DTN-5 | C10V5U | CCTN-050 | DN7-550 | 10TCU-V50 |
| C22 | 1500 | | | | BPD-0015 | DD-152 | BYA10D15 | CCD-152 | GP215 | 5HK-D15 |
| C23 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C24 | .047 | 200V | | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C25 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C26 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C27 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C28 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C29 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C30 | 100 | N150 | 10% | | | | | * | | 10TCP-T10 |
| C31 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C32 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C33 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C34 | 5 | N750 | 10% | | | DTN-5 | C10V5U | CCTN-050 | CN7-550 | 10TCU-V50 |
| C35 | 1000 | | 10% | | DI-1000 | DD-102 | 1R5D1 | CCD-102 | GP210 | 10TS-D10 |
| C36 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C37 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C38 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C39 | 10 | NPO | 10% | | NPO-DI 10 | DTZ-10 | C10Q1C | CCTO-100 | CNO-410 | 10TCC-Q10 |
| C40 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C41 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C42 | 10000 | | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## FIXED CAPACITORS (cont)

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C43 | 100 N150 10% | | | | | * | | 10TCP-T10 |
| C44 | 1500 10% | | DI-1500 | DD-152 | 1R5D15 | CCD-152 | GP215 | 10TS-D15 |
| C45 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C46 | .1 200V | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |
| C47 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C48 | 5000 | | BPD-005 | DD-503 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C49 | .047 200V | | P288N-047 | DD-503 | CUB2S47 | 4DP-3-473 | GEM-4147 | 2TM-S47 |
| C50 | .1 200V | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | PILOT PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 1meg 650K Tap | ½ | 39-41 | ABT-74 | A47F5-1meg | Q19-137X | RU16T654 * | Audio Level |
| B | Shaft | | | AK-1 | FKS-1/4 | Not Req. | SL3500 | Tap not used |
| R2A | 10K | ½ | 39-46 | AB-14 | B47-10K-S | B11-116 | SU-20 | Meter Center Set |
| B | Shaft | | | AK-1 | Not Req. | TM-4 | Not Req. | |
| R3A | 5000Ω | ½ | 39-42 | BX-10 | B47-5000-S | B11-114 | SU-14 | Muting Threshold |
| B | Shaft | | | Not Req. | Not Req. | TM-4 | Not Req. | |

* Use SL38 Bushing.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 270Ω | |
| R5 | 270K | |
| R6 | 270Ω | |
| R7 | 1meg | |
| R8 | 1000Ω | |
| R9 | 12K | |
| R10 | 12K | |
| R11 | 470Ω | |
| R12 | 6800Ω | |
| R13 | 270K | |
| R14 | 1000Ω | |
| R15 | 12K | |
| R16 | 68Ω | |
| R17 | 1000Ω | |
| R18 | 12K | |
| R19 | 68Ω | |
| R20 | 220K | |
| R21 | 68K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R22 | 1meg | |
| R23 | 4700Ω | |
| R24 | 12K | |
| R25 | 270Ω | |
| R26 | 12K | |
| R27 | 6800Ω | |
| R28 | 33K | |
| R29 | 2200Ω | |
| R30 | 180Ω | |
| R31 | 1000Ω | |
| R32 | 27K | |
| R33 | 270Ω | |
| R34 | 100K 5% | |
| R35 | 100K 5% | |
| R36 | 39K | |
| R37 | 68K | |
| R38 | 1meg | |
| R39 | 1000Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R40 | 2200Ω | |
| R41 | 100K | |
| R42 | 2.2meg | |
| R43 | 220K | |
| R44 | 100K | |
| R45 | 470K | |
| R46 | 39K | |
| R47 | 1500Ω | |
| R48 | 3300Ω | |
| R49 | 220K | |
| R50 | 39K | |
| R51 | 470Ω | |
| R52 | 10K | |
| R53 | 1500Ω 1W | |
| R54 | 220Ω 4W | |
| R55 | 220Ω 4W | |
| R56 | 100K | |
| R57 | 15K 2W | |

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | PILOT PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Antenna Coil | 70-86 | | | | | | |
| L2 | RF Choke | 75-52 | 19-2002 | 19-2002 | | 4582 | | .15uh |
| L3 | Cathode Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L4 | RF Choke | 75-33 | 19-1004 | 19-1004 | SW-631 | 4529 | | 5uh |
| L5 | RF Choke | | | | | | | ① |
| L6 | RF Coil | 71-47 | | | | | | |

## COILS (RF-IF) (cont)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | PILOT PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L7 | Fil. Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L8 | Fil. Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L9 | Cathode Choke | 75-33 | 19-1004 | 19-1004 | SW-631 | 4529 | | 5uh |
| L10 | Osc. Coil | 72-82 | | | | | | |
| L11 | 1st FM IF | 273-151 | 16-3487 | 16-3487 | FM-254 | 1463 | | |
| L12 | 2nd FM IF | 273-151 | 16-3487 | 16-3487 | FM-254 | 1463 | | |
| L13 | 3rd FM IF | 273-151 | 16-3487 | 16-3487 | FM-254 | 1463 | | |
| L14 | 4th FM IF | 273-151 | 16-3487 | 16-3487 | FM-254 | 1463 | | |
| L15 | RF Choke | 75-51 | 19-3075 | 19-3075 | TV-186 | 6172 | VP-2 | 80uh |
| L16 | 5th FM IF | 275-154 | | | | | | |
| L17 | Discriminator | 279-71 | 17-3494 | 17-3494 | FM-253 | 1464 | | |
| L18 | Fil. Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L19 | Line Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |
| L20 | Line Choke | 75-19 | 19-1001 | 19-1001 | BC-562 | 4604 | | 1.6uh |

① Three turns wire on 68Ω resistor.

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | PILOT PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 117V | 420VCT | 6.3V | 55-67 | | | | | | |
| | ② .56A | ② .095A | ② 2.9A | | | | | | | |
| | SEC. 3 | SEC. 4 | SEC. 5 | | | | | | | |
| | 6.3VCT ② .6A | | | | | | | | | |

## CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|
| | | PILOT PART No. | CBS PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| M1 | 1N541 * | | 1N60 | 1N295 | 1N295 | Discriminator } Matched |
| M2 | 1N541 * | | 1N60 | 1N295 | 1N295 | Discriminator } Pair |
| M3 | 1N541 | | 1N60 | 1N295 | 1N295 | AVC (Pigtail) |
| M4 | 1N541 | | 1N60 | 1N295 | 1N295 | Muting Clamp (Pigtail) |

* Alternate Type 1N542.

## MISCELLANEOUS

| ITEM No. | PART NAME | PILOT PART No. | NOTES |
|---|---|---|---|
| M5 | Tuning Cap. | 26-24 | 3 Gang |
| M6 | Switch | 100-139 | Off-On |
| M7 | Switch | 100-137 | Muting |
| M8 | Meter | 110-582 | Tuning |

## WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder



RECORDIO
MODEL R-603-A

RECORDIO
MODEL R-603-A

## GENERAL INFORMATION

The Recordio Model R-603 is a dual-track tape recorder. Dual-track recording gives two full-length recordings on a reel of tape. Any size reel up to five inches can be used. The Recordio has a tape speed of 3 3/4 ips. When both tracks are used, the recording time for a 5-inch reel is one hour.

The Recordio can be placed in any mode of operation by sliding the gear-shift lever to Record, Play, Forward, Reverse, or Stop.

New recordings can be made on previously recorded tape, because the erase head is automatically positioned when the gear-shift lever is in Record. Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from a microphone.

This type recorder operates on 60 cycles, 117 volts AC only. Before connecting to a line supply, be absolutely certain it agrees with the foregoing specifications. The recorder will be severely damaged if connected to a direct current (DC) line.

Manufactured by:
Recordio Corporation
Charlotte, Michigan

*This material compiled and published by*

HOWARD W. SAMS & CO., INC., INDIANAPOLIS 6, INDIANA

CQ417

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SET 476 FOLDER 12

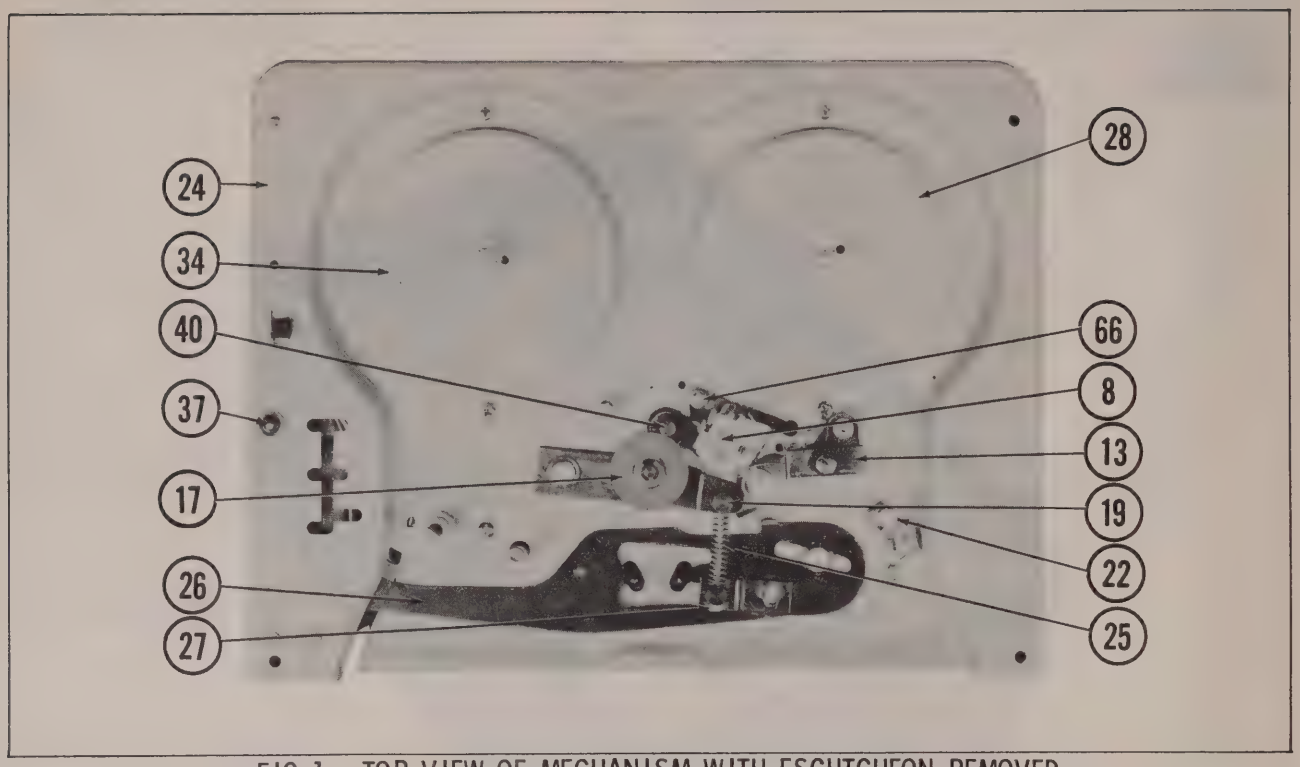



FIG.1 TOP VIEW OF MECHANISM WITH ESCUTCHEON REMOVED

## PREPARING FOR OPERATION

1. Remove the AC cord, reel of tape, empty reel, and microphone from the case storage compartment.
2. Place the gear-shift lever in the Stop position.
3. Plug the AC cord into a convenient wall receptacle of proper rating and into the AC input on the cabinet.
4. Insert the microphone plug into the microphone input.

   NOTE: Always keep the gear-shift lever in the Stop position when the recorder is not in use.

## OPERATING INSTRUCTIONS

### Threading The Tape

1. Place a reel of tape on the supply reel platform, making certain one of the reel slots engage the protrusion on the reel platform. Place an empty reel on the take-up reel platform, again making certain one of the reel slots engage the protrusion on the take-up reel platform.
2. Unwind about 14 inches of tape from the supply reel. Hold a section of tape taut and insert it into the tape slot, making sure the dull-coated side of the tape faces the heads.
3. Insert the free end of the tape into one of the three slots in the hub of the take-up reel. While holding the end of the tape in place, turn the reel two or three times to secure the tape to the reel.

### To Record From A Microphone

1. Turn the On-Off-Volume control to the right. Allow sufficient time for the unit to warm up.
2. Insert the microphone plug into the microphone jack.
3. Turn the function control knob to the Record position.
4. Slide the gear-shift lever to the Record slot until the lower tip of the knob depresses the button. This releases the Record and Play lever and thus prevents accidental erasure.
5. Move the Monitor switch to the On position.
6. Adjust the Volume control for the desired volume. Do not turn the volume up too high because the recording will be distorted.

   NOTE: The Monitor switch is used to monitor or turn off the speaker while recording. To eliminate squeal (feedback) from the speaker to the microphone, turn the Monitor switch off after the recording level has been set.

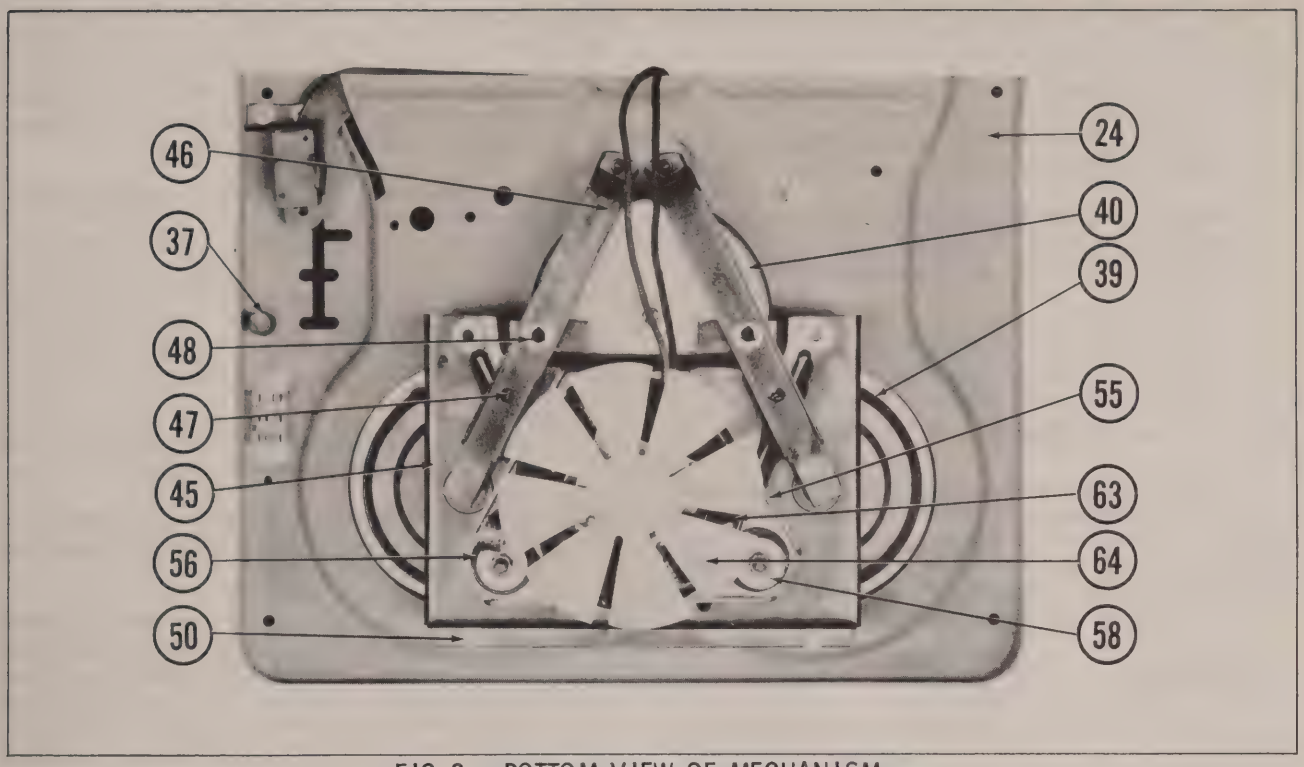



FIG.2 BOTTOM VIEW OF MECHANISM



## To Record From a Radio, Television Receiver, Or Phonograph

1. Insert the phonograph plug into the Phono input.
2. For a radio or television recording, connect the patch cord (Part No. C20.233) across the voice coil of the radio or television receiver speaker with alligator clips. Then plug the cord into the Phono jack.
3. Proceed with the recording as described under "To Record From a Microphone".

NOTE: Remove the patch cord from the Phono jack after completing the recording.

## To Use The Second Track

1. Slide the gear-shift lever to Stop after all tape has been wound onto the take-up reel.
2. Remove the reel containing the tape; Turn it over, and place it on the supply-reel platform farthest from the front of the case.
3. Place the empty reel on the take-up platform closest to the front of the case.
4. Thread the tape, and proceed with the recording as described under "To Record From a Microphone" or "To Record From a Radio, Television Receiver, or Phonograph".

## To Erase The Tape

When the gear-shift lever and function control knob are in the Record position, the erase head is automatically positioned. Any previous recordings are erased while a new one is being made. Material no longer needed can be erased, without recording, by turning the Volume control to minimum. One track is erased at a time. To erase the second track, turn the reels over and reverse them, and repeat the foregoing operation.

## To Play A Recording

1. Thread the tape as described under "Threading the Tape".
2. Slide the gear-shift lever into the Play position, and turn the function control knob to Play.
3. Adjust the volume to the desired level.

## High-Speed Forward Or Reverse

It is not necessary to rewind the entire tape in order to play a certain portion over. Moving the gear-shift lever to Forward or Reverse will rapidly advance or reverse the tape. Thus, several minutes of normal recording can be skipped in a few seconds.

## To Use As A Public-Address System

1. To use the unit as a public-address system, merely plug in the microphone and advance the Volume control to the desired level, making certain the Monitor switch is on.
2. If additional power or coverage is desired, the external speaker jack can be used for connecting another speaker (or speakers).

## DISASSEMBLY INSTRUCTIONS

### To Remove Unit From Case

1. Remove the four Phillips head screws from the corners of the top plate.

2. Remove the two Phillips head screws from the metal plate on the right side of the unit. Turn the plate sideways, and place it inside the case.

3. Lift the unit partially out of the case. Remove the speaker plugs from the amplifier chassis; then remove the unit completely.

4. To reassemble, reverse the foregoing procedure.

## ADJUSTMENTS

### Hum-Balance Adjustment

Place the unit in the Record position, and turn the volume to maximum. Short out the bias at L1. Connect a VTVM to the External Speaker jack. Set the VTVM to AC volts, 3-volt scale, with a 3.3-ohm load resistor across the meter. Adjust hum-balance control R2 for minimum deflection on the meter.

### Head Alignment

Use a standard 6- or 12- KC alignment tape. Remove the front and rear escutcheons. Clean the pole pieces of the play-record head with a good commercial Head cleaning agent or with naptha or lighter fluid; Then proceed as follows:

1. Thread the alignment tape on the recorder, and turn the Volume control to Maximum. Connect a VTVM to the External Speaker jack. Set the meter for AC volts, 3-volt range.

2. Place the unit in the Play position. Decrease the volume until the output is 1 volt on the meter. Rotate play-record head adjustment screw (66) until the maximum deflection point is found.

### Pinch-Roller Adjustment

If pinch roller (17) is damaged or out of adjustment, replace, clean, and adjust it in the following manner.

1. Remove the front escutcheon.

2. Remove E ring (15), and lift off pinch roller (17).

3. Clean pinch roller (17) thoroughly, and relubricate. Reassemble in the reverse order from that of Step 2.

4. Adjust pinch roller (17) by turning screw (27) clockwise or counterclockwise. Pinch roller (17) should make good contact with the capstan shaft.

### Erase Head Adjustment

1. With the tape properly threaded, turn the recorder on and move the gear shift lever to the Record position. Allow the tape to run for a few seconds; then turn the recorder off, but leave the gear-shift lever in Record.

2. With rear escutcheon (2) and front escutcheon (4) removed, check erase head (13) to see that it is parallel with the tape.

3. Make sure the top edge of the tape coincides with the top end of the diagonal slot in the erase head (junction of the long diagonal and short vertical slots). (See Fig. 3). To adjust the tape level, loosen tape guide hex nut (21) and rotate tape guide (22) to move the tape up or down. (See the Exploded View.)

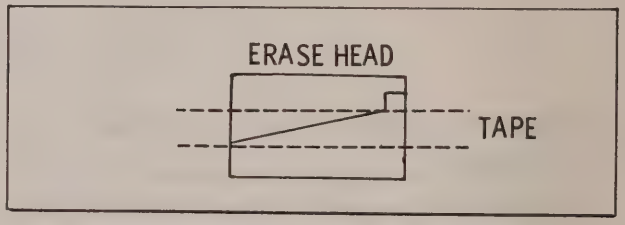



FIG.3 ERASE HEAD ADJUSTMENT

### Lift Lever Adjustment

1. When lift lever (46) is out of adjustment in the Forward position, reel platform (28) must be raised until it clears clutch spring plate (36). At the same time, reel platform (34) must be lowered until it contacts clutch spring plate (36); and lift lever (46) must clear the lower end of the front reel platform shaft by approximately 1/32 to 1/16 inch. To adjust front lift lever (46), bend the short flanged section of the lever (under the front reel platform shaft) until the clearance is 1/32 to 1/16 inch.

2. In the Reverse position, reel platform (28) is lowered and reel platform (34) is raised. Adjust lift lever (46) as described in Step 1, leaving a clearance of 1/32 to 1/16 inch.

NOTE: In the Record and Playback positions, both lift levers (46) must clear the reel platform shafts, so that both reel platforms will contact clutch spring plates (36).

## CLEANING

Most defects, other than wear or breakage, can be traced to dirty surfaces. Record head (8), flywheel

(40), and pinch roller (17) may accumulate tape coating oxide, which is worn off the tape as it passes these parts. This accumulation should be removed periodically, since it will cause faint recording and poor playback. Wipe the surfaces carefully with a clean cloth. If dirt is so caked or hard that it cannot be removed with a dry cloth, dampen the cloth slightly with alcohol.

## LUBRICATION

All rotating parts have factory-lubricated Oilite bearings. Under normal usage, no further lubrication is necessary. In heavy-duty service, the following parts should be lubricated once a year with a drop of No. 10 motor oil.

1. Top and bottom motor bearings.
2. Capstan bearing.
3. Pinch roller (17) bearing.
4. Sheave bearings (51).

CAUTION: Do not overlubricate. Keep oil off all rubber belts and the flywheel rim, and off any part that might transfer oil to them. Always wipe excess lubricant from lubricated parts.

## TROUBLE CHART

| SYMPTOM | CAUSE | REMEDY |
|---|---|---|
| No erase, or incomplete erase. | 1. Erase head and plate assembly (13) not actuated by function shift lever assembly(26), because of bent tabs on erase head assembly or function shift lever assembly. | 1. Bend the tabs on erase head assembly or function shift lever assembly. |
| | 2. Erase head and plate assembly (13) not properly adjusted. | 2. See "Erase Head Adjustment". |
| Does not record. | 1. Faulty microphone or cord. | 1. Replace the microphone or cord, after checking the recorder with another type of input. |
| | 2. Faulty input jack. | 2. Replace the input jack. |
| | 3. Faulty tube. | 3. Replace any defective tubes. |
| | 4. Low bias voltage. | 4. Check the circuit for the defective part. |
| | 5. Open record head (8). | 5. Check the continuity. After checking the continuity, demagnetize the head. |
| Motor and amplifier do not operate. | 1. Defective power supply. | 1. Check the voltage per schematic. |
| | 2. Damaged power cord. | 2. Repair or replace the power cord. |
| | 3. Defective On-Off switch. | 3. Replace the On-Off switch. |
| No fast forward or rewind. | 1. Belt (43) broken or not connected properly. | 1. Replace or reconnect belt (43). |
| | 2. Defective clutch ring (38) or (52). | 2. Replace clutch ring (38) or (52). |
| | 3. Lift lever (46) out of adjustment. | 3. See "Lift Lever Adjustment". |
| Reel platforms (28) and (34) do not rotate in all functions. | 1. O ring belt (44) loose or broken. | 1. Reposition O ring belt (44), or replace if broken. |
| Low output. | 1. Faulty output tube V2. | 1. Replace tube V2. |

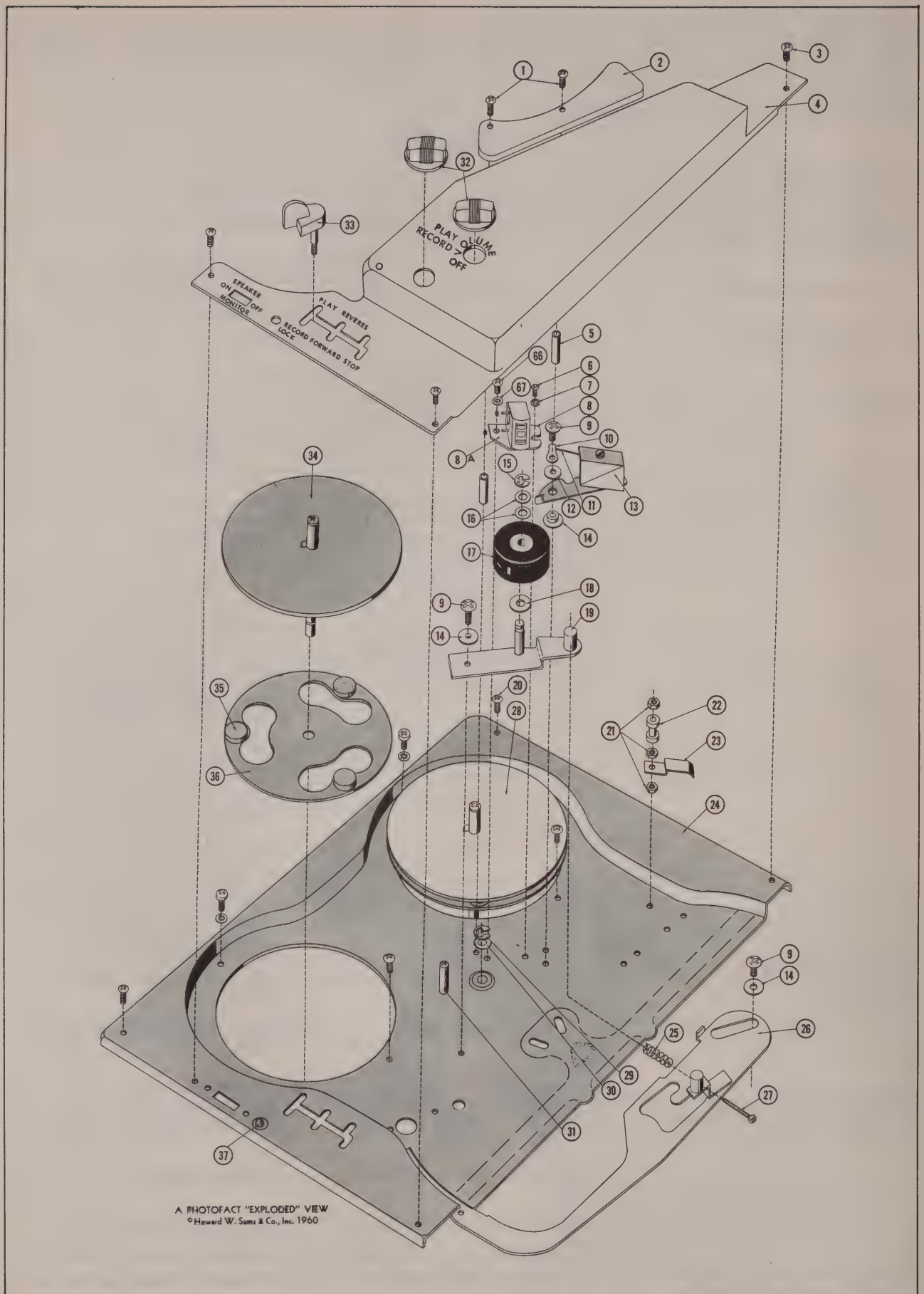



FIG. 4A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

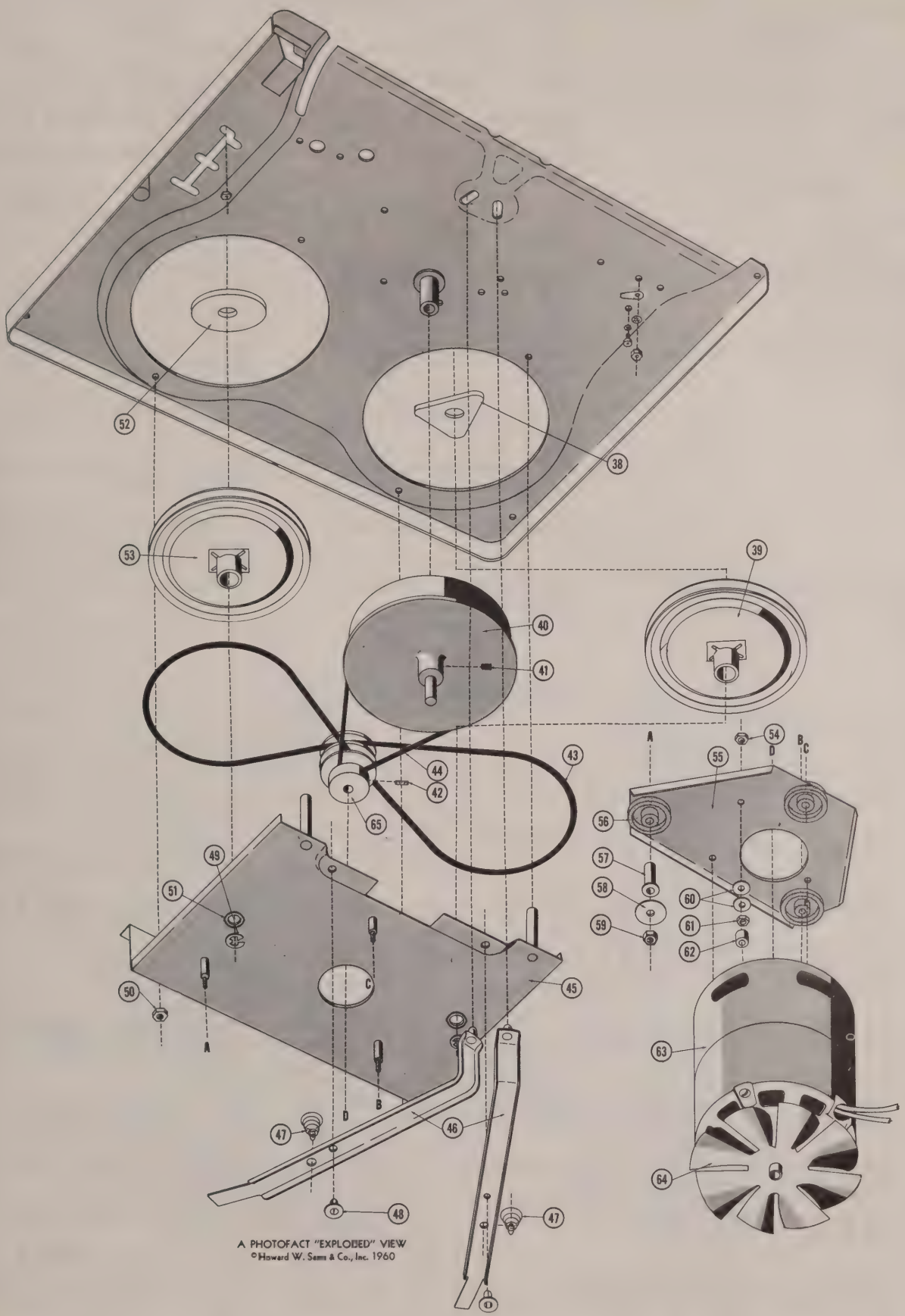



FIG.4B EXPLODED VIEW OF PARTS BELOW BASEPLATE

## TROUBLE CHART (CON'T.)

| SYMPTOM | CAUSE | REMEDY |
|---|---|---|
| | 2. Defective record head (8). | 2. Replace record head (8). |
| Hum. | 1. Noisy tape. | 1. Compare with another tape. |
| | 2. Shorted or leaky filter capacitors C1. | 2. Replace filter capacitor C1. |
| | 3. Poor mike cable shielding during recording. | 3. Check connection of shield on mike cable. |
| Poor frequency response during playback. | 1. Accumulation of foreign matter or tape coating oxide on head pole pieces. | 1. Clean the head. |
| Recorded tape does not play back. | 1. Function switch in the Record position. | 1. Place the function switch in the Play position. |
| | 2. Tape incorrectly positioned in the tape slot. | 2. See "Threading the Tape". |
| | 3. Piece of splicing tape sticking to head pole pieces. | 3. Remove the splicing tape and clean the head. |
| | 4. Volume control set at zero. | 4. Rotate the Volume control to the desired listening level. |
| Records weakly and with very poor frequency response. | 1. Dull-coated side of tape not facing the heads. | 1. Reverse the tape on the reels. |

## MECHANICAL PARTS LIST

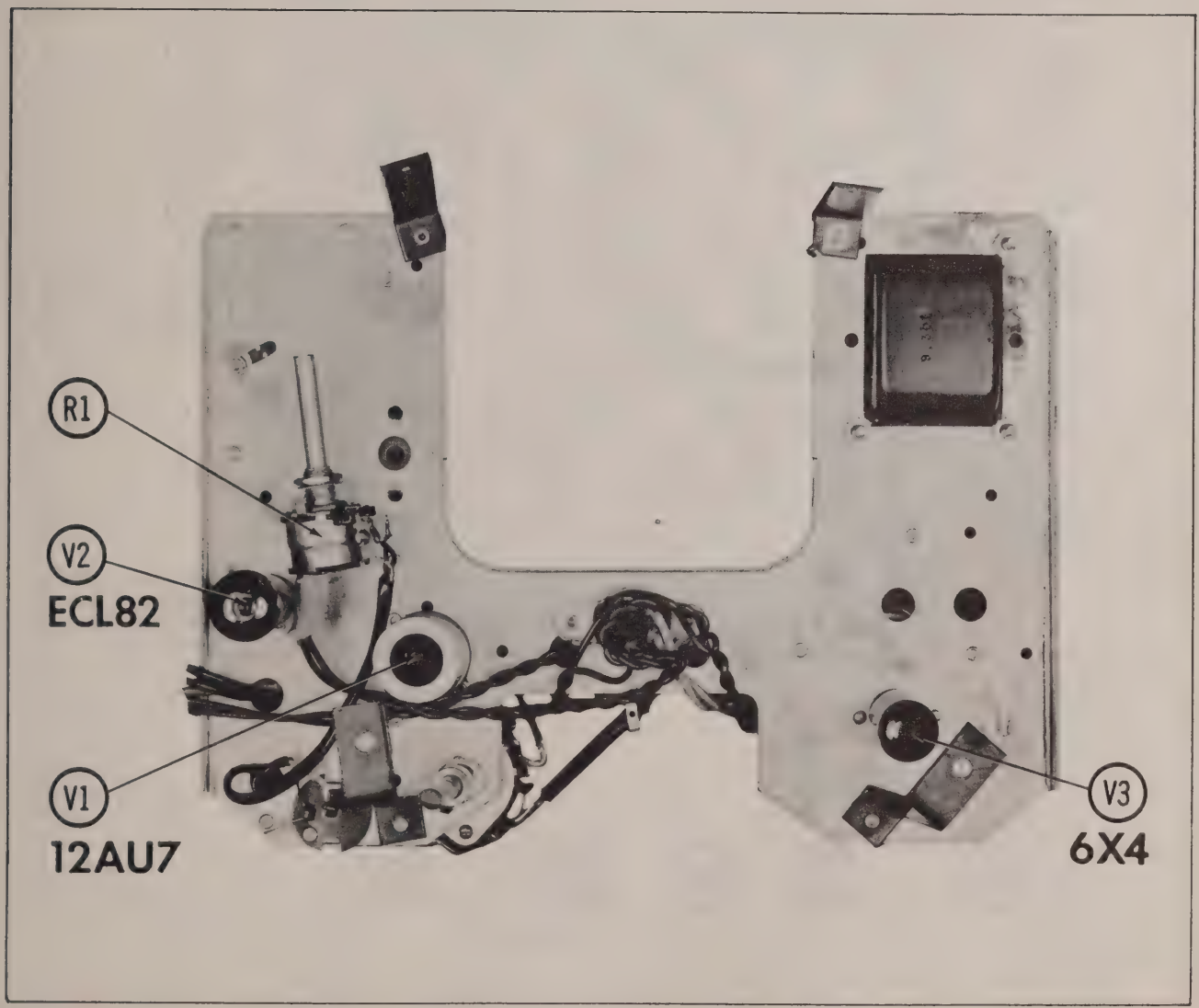
| Ref. No. | Part No. | Description |
|---|---|---|
| 1 | 57-6C-620-5 | #6-32 x 1 1/4 R.H.M.S. Stl. C.P. Phil. |
| 2 | B-13.426 | Rear Escutcheon (Head Cover) |
| 3 | 57-46C-406-6 | #4 x 3/8 R.H.W.S Stl. Park. Phil. |
| 4 | B-13.427 | Front Escutcheon |
| 5 | 63-2085-43 | Roller Tubing Spacer 1 1/16 x .144 ID x 1/4 O.D. (2). |
| 6 | 57-16C-404-1 | #4-40 x 1/4 R.H.M.S. Slotted |
| 7 | 73-2231-3 | #4 Int. Lockwasher C.P. |
| 8 | B-35.1296-1 | Record Head & Bracket Assembly |
| 8A | B.19.1582 | Record Head Spring |
| 9 | 57-7C-804-1 | #8-32 x 1/4 T.H.M.S. Stl. C.P. (3) |
| 10 | 44-2087-3 | Solder Lug |
| 11 | B-13.483 | Erase-Head Retract Spring |
| 12 | 73.2241-74F | #8 Flat Washer Stl. C.P. Flattened |
| 13 | B-35.1286-1 | Erase Head and Plate Assembly |
| 14 | B-32.448 | Shoulder Washer (3) |
| 15 | | "E" Ring For Pinch Roller |
| 16 | B-28.163 | Linen Washer (2) |
| 17 | B-33.601 | Pinch Roller |
| 18 | | Washer |
| 19 | B-19.1571 | Pinch-Roller Plate |
| 20 | 57-66C-820-5 | #8 x 1 1/4" R.H.M.S. Stl. N.P. Nil. (4) |
| 21 | | Tape-Guide Hex Nuts (3) |
| 22 | B-32.394 | Tape Guide |
| 23 | B-19.1520 | Tape Positioning Bracket 1" |
| 24 | D-35.1293-1 | Base Plate and Capstan Housing Assembly |
| 25 | B-31.482 | Compression Spring |
| 26 | C-35.1288-1 | Function Shift Lever Assembly |
| 27 | 57-6C-626-1 | #6-32 x 1 5/8 R.H.M.S. Stl. C.P. |
| 28 | B-35.995-1 | Reel Platform and Shaft Ass'y. |
| 29 | | "E" Ring For Flywheel |
| 30 | | Washer |
| 31 | | Roller Tubing Spacer |
| 32 | B-13.431 | Control Knob (2) |
| 33 | B-13.362 | Shift Knob |
| 34 | B-35.995-1 | Reel Platform and Shaft Ass'y. |
| 35 | B-31.409 | Clutch Button Felt (6) |
| 36 | B-19.1318 | Clutch Spring Plate (2) |
| 37 | 87-2342 | Bullet Catch |
| 38 | B-31.410 | Clutch Ring, Felt (Rear) |
| 39 | B-35.994 | Reel Drive Sheave Ass'y. |
| 40 | B-13.432 | Flywheel |
| 41 | 57-3589-0 | #8-32 Bristol Head Set Screw 1/4" |
| 42 | | Motor Pulley Set Screw |
| 43 * | B-28.188 * | * Belt 21" Long (Sheaves) |
| 44 * | B-28.200 * | * "O" Ring |
| 45 | D-35.1290-1 | Motor Mounting Plate and Pulley Ass'y. |
| 46 | B-35.998-1 | Lift Lever and Pin Assembly (2) |
| 47 | B-31.405 | Lift Lever Spring (2) |
| 48 | B-35.512 | Tri-Mount Stud (2) |
| 49 | | "E" Ring |

## MECHANICAL PARTS LIST (CON'T.)

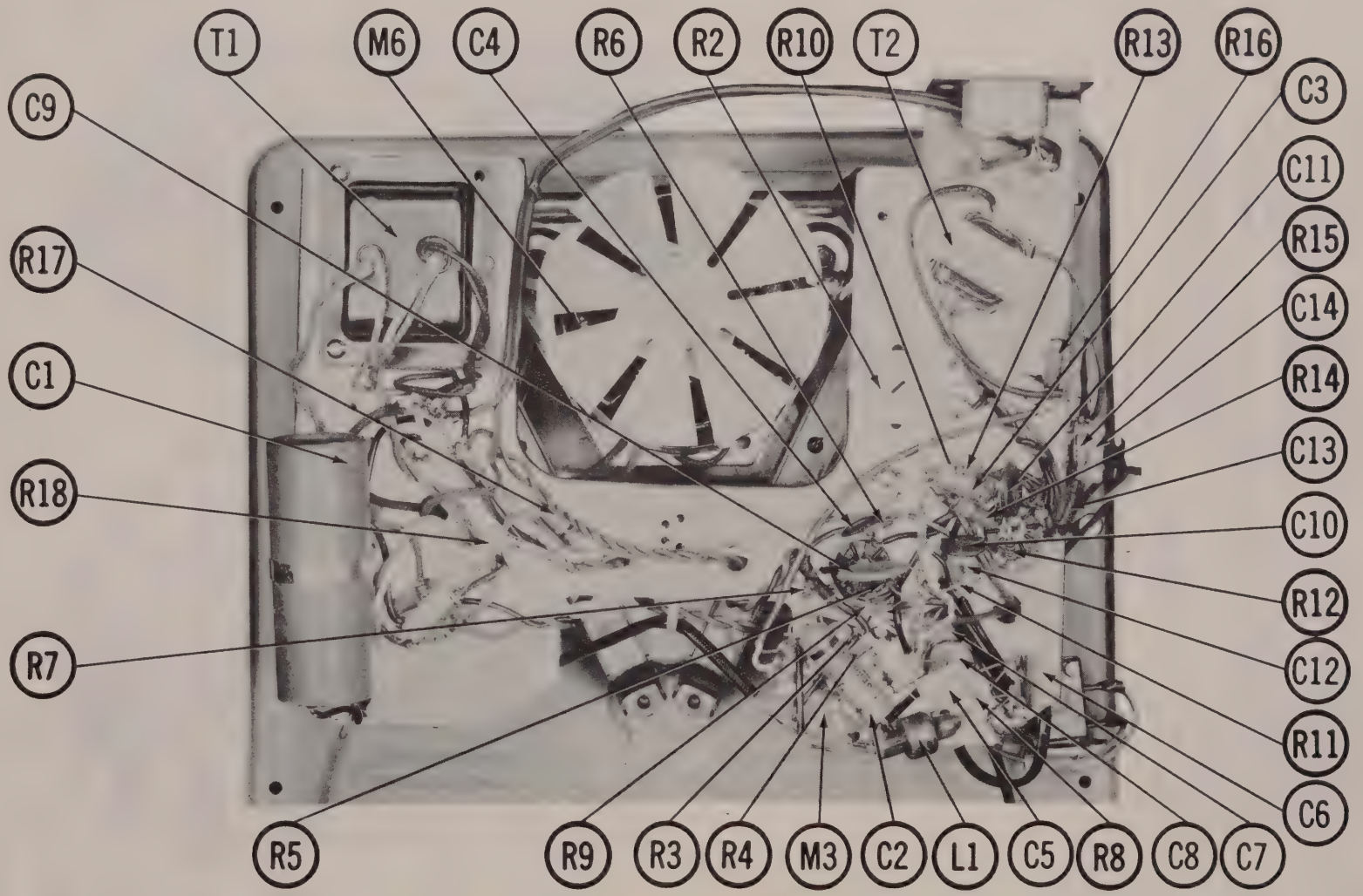
| Ref. No. | Part No. | Description |
|---|---|---|
| 50 | | Hex Nut |
| 51 | B-35.968 | Sheave Bearing Ass'y. (2) |
| 52 | B-31.411 | Clutch Ring, Felt (Front) |
| 53 | D-35.994 | Reel-Drive Sheave Ass'y. |
| 54 | | Hex Nuts (3) |
| 55 | D-35.1292 | Motor-Mounting Plate Ass'y. |
| 56 | B-28.186 | Rubber Mounting Grommet (3) |
| 57 | | Grommet Inserts (3) |
| 58 | | Washer (3) |
| 59 | | Hex Nuts (3) |
| 60 | 73-2241-136 | Flat Washer 1/2 x .188 x 1/32 Stl. C.P. (6) |

| Ref. No. | Part No. | Description |
|---|---|---|
| 61 | | Motor Hex Nut |
| 62 | | Motor Spacer (3) |
| 63 | 36.205 | Motor |
| 64 | B-33.606 | Fan |
| 65 | B-32.442 | Motor Pulley |
| 66 | | Head Adjustment Screw |
| 67 | | Lockwasher |

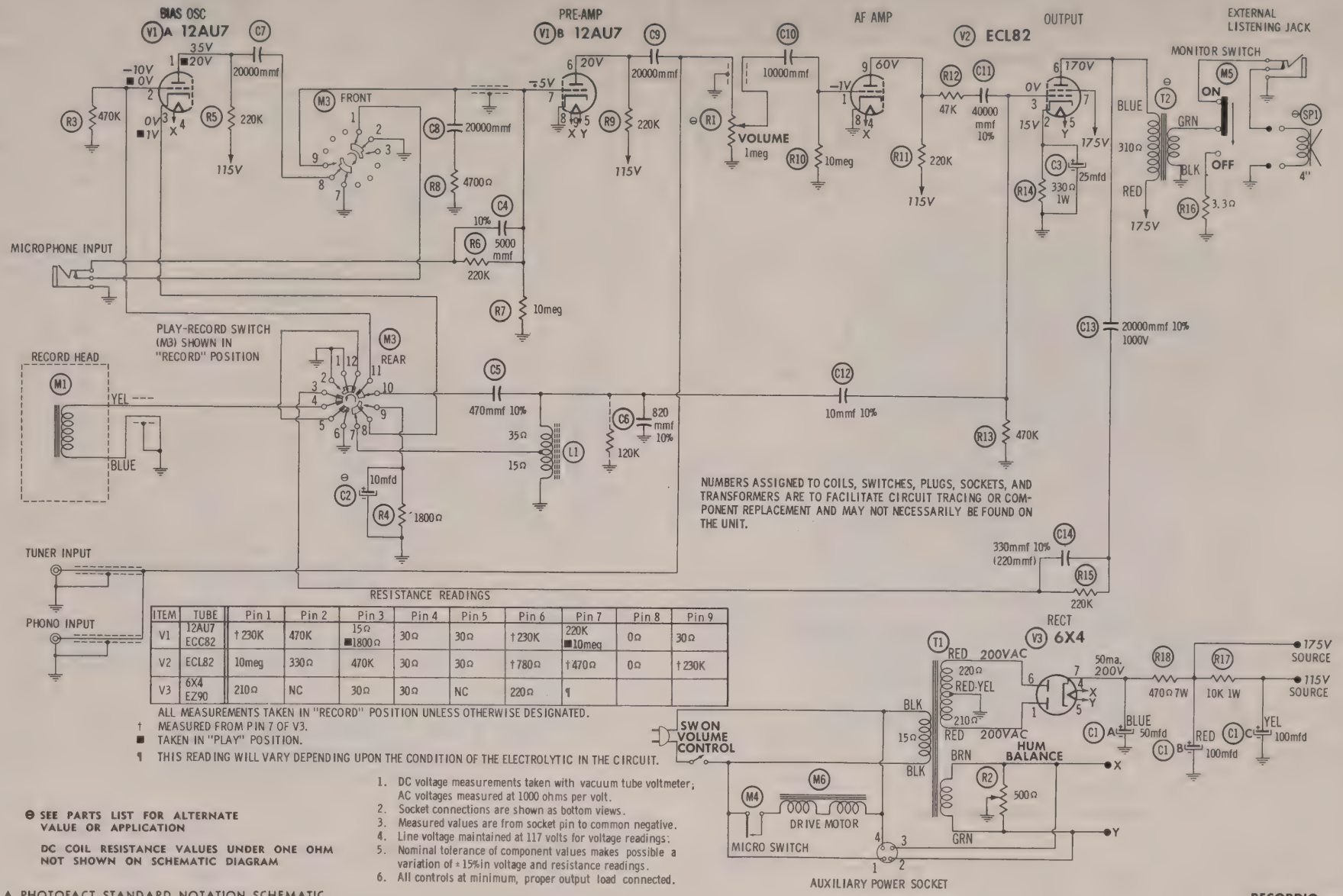
* Ref. No. 43, Belt - WALSCO Part No. 1410-21.
Ref. No. 44, "O" Ring - WALSCO Part No. 1410-12.




AMPLIFIER CHASSIS—TOP VIEW




AMPLIFIER CHASSIS—BOTTOM VIEW




RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AU7 ECC82 | †230K | 470K | 15Ω ■1800Ω | 30Ω | 30Ω | †230K | 220K ■10meg | 0Ω | 30Ω |
| V2 | ECL82 | 10meg | 330Ω | 470K | 30Ω | 30Ω | †780Ω | †470Ω | 0Ω | †230K |
| V3 | 6X4 EZ90 | 210Ω | NC | 30Ω | 30Ω | NC | 220Ω | ¶ | | |

ALL MEASUREMENTS TAKEN IN "RECORD" POSITION UNLESS OTHERWISE DESIGNATED.

† MEASURED FROM PIN 7 OF V3.

■ TAKEN IN "PLAY" POSITION.

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings:
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RECORDIO MODEL R-603-A



RECORDIO MODEL R-603-A

# AMP PARTS LIST AND DESCRIPTIONS

## TUBES

| • CBS • GENERAL ELECTRIC • | | | • RAYTHEON • SYLVANIA • | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | Preamp. - Bias Osc. | 12AU7/ECC82 | V3 | Rectifier | 6X4/EZ90 |
| V2 | AF Amp. - Output | ECL82 (6BM8) * | | | |

* Alternate

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | RECORDIO PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
| C1A | 50 | 200 | B-5.474 | | | | CDBF-1009 | TVL-2464 | |
| B | 100 | 200 | | | | | | TVA-1512 | |
| C | 100 | 200 | | | | | | | |
| C2 | 10 | 25 | B-5.455 ① | PRS1250 | BBR10-25 | TC22 | TD-10-25 | TVA-1204 | |
| C3 | 25 | 25 | B-5.475-2 | SRE25V25 | NLW25-25 | TT25X25 | TD-25-25 | TE-1207 | |

① Some versions may use 25mfd in this application (B-5.475-2).

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C4 | 5000 | 10% | | DI-5000 | | PM6D5 | CCD-502 | JL250 | 10TS-D50 |
| C5 | 470 | 10% | | 1469-00047 | DD-471 | 5R5T47 | CM-20B-471K | MCJ244 | MS-347 |
| C6 | 820 | 10% | | 1469-00082 | DD-821 | 1R5T82 | CM-20B-821K | MCB251 | MS-382 |
| C7 | 20000 | | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C8 | 20000 | | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C9 | 20000 | | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C10 | 10000 | | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C11 | 40000 | 10% | | | | PM6S4 | 6DP-3-403 | GEM-614 | 6TM-S4 |
| C12 | 10 | 10% | | 1469-00001 | TCZ-10 | 22R5Q1 | CM-20B-100K | MCB215 | MS-410 |
| C13 | 20000 | 1000V 10% | | | | | 16DP-4-203 | GEM-1612 | 10TM-S2 |
| C14 | 330 | 10% | (220mmf) * | 1469-00033 | DD-330 | 22R5T33 | CM-20B-331K | MCB241 | MS-330 |

* Alternate Value

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | RECORDIO PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 1meg | ½ | C-8.227-12 | BT-74 | A47F5-1meg | Q19-137X | UT-443 | Volume Note 1 |
| B | Shaft | | | Not Req. | FS-3 | Not Req. | Not Req. | |
| C | Switch | | | KR-1 | SWE-12 | 76-1 | US-26 | Power Off-On |
| R2A | 500Ω | ½ | B-8.240 | AB-4 | A47-500-S | B11-103 | PTA52L | Hum Balance |
| B | Shaft | | | AK-1 | FKS-1/4 | SK-2 | Not Req. | |

Note 1. Alternate Part #C-8.227-13.

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R3 | 470K | |
| R4 | 1800Ω | |
| R5 | 220K | |
| R6 | 220K | |
| R7 | 10meg | |
| R8 | 4700Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R9 | 220K | |
| R10 | 10meg | |
| R11 | 220K | |
| R12 | 47K | |
| R13 | 470K | |
| R14 | 330Ω 1W | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R15 | 220K | |
| R16 | 3.3Ω | |
| R17 | 10K 1W | |
| R18 | 470Ω 7W | |

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | RECORDIO PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Bias Osc. Coil | B-L.557 | | | | | | |

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | RECORDIO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 117V @ .31A | 400VCT @ .050A | 6.3V @ 1.5A | C-9.306 | | | | | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | RECORDIO PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T2 | 6000Ω | 3-4Ω | B-2.282-2 ① | 24851 | A-2930 | AU-601 | A-3877 | 24851 | S-3X | ① Alternate Part #B-9.282-2 |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | RECORDIO PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3-4Ω | C-30.353-1 | 4A1 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | RECORDIO PART No. | NOTES |
|---|---|---|---|
| M1 | Record Head | B-35.1296-1 | Includes Mounting Bracket |
| M2 | Erase Head | B-35.1286-1 | Permanent Magnet Type, Includes Mounting Bracket |
| M3 | Switch | B-11.259 | Function (Rotary Wafer Type) |
| M4 | Switch | B-11.271-2 | Micro |
| M5 | Switch | B-11.287 | Speaker (SPDT, Slide Type) |
| M6 | Motor | 36.205 | |
| | Microphone | 36.195 | |

## CABINETS & CABINET PARTS

**(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)**

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | B-13.431 | Volume, Function |
| Knob | B-13.362 | Shift |
| Handle | 87.3162-1 | |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

PHOTOFACT® Folder

EIA MEMBER

# ROLAND MODEL 61-482 (5TR)

ROLAND MODEL
61-482 (5TR)

| | |
|---|---|
| TRADE NAME | Roland Model 61-482 (5TR) |
| MANUFACTURER | Roland Radio Corp., A Div. of Herold Radio & Electronics, 716 S. Columbus Ave., Mount Vernon, N.Y. |
| TYPE SET | Battery Operated Transistorized Portable AM Receiver |
| POWER SUPPLY | 9 Volts DC |
| RATING | 18MA @ 9 Volts DC |
| TUNING RANGE—BROADCAST | 540 - 1620KC |

## ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A4, A6 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A5 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | .1mfd | High side to Converter Base. Low side to chassis. | 455KC (400~ Mod.) | Tuning gang fully open | Across voice coil | A1, A2, A3 | Adjust for maximum output. |
| 2. | | Loop | 1620KC | " | " | A4 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | | " | 540KC | Tuning gang fully closed | " | A5 | Adjust for maximum output. Repeat steps 2 and 3. |
| 4. | | " | 1400KC | Tune to 1400KC signal | " | A6 | Adjust for maximum output while rocking tuning gang. |

DISASSEMBLY

1. Remove rear cover (Press area marked "Press to Open").
2. Remove battery holder.
3. Remove earphone jack mounting nut.
4. Remove screw holding speaker frame to case.
5. Remove 2 brass Phillips head screws holding chassis to case.
6. Remove chassis from case.

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JF508

DATE 3-60 SET 476 FOLDER 13

SET 476 FOLDER 13

# PARTS LIST AND DESCRIPTIONS

## TRANSISTORS

| ITEM No. | ORIG. TYPE | USE | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | CBS PART No. | RCA PART No. | RAYTHEON PART No. | SYLVANIA PART No. | |
| X1 | 2N411 | Converter | | 2N411 | 2N486 | 2N411 | PNP |
| X2 | 2N409 | 1st IF Amplifier | | 2N409 | 2N483 | 2N409 | PNP |
| X3 | 2N409 | 2nd IF Amplifier | | 2N409 | 2N483 | 2N409 | PNP |
| X4 | R67 | Detector | | | | | PNP |
| X5 | 2N405 | Driver | | 2N405 | 2N362 | 2N405 | PNP |
| X6 | 2N407 | Output | 2N180 | 2N407 | 2N362 | 2N407 | PNP |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | ROLAND PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1 | 100 | 10 | ① | PWE10100 | NLW100-10 | TT15X100 | ML100-15 | TE-1119. 3 | |
| C2 | 10 | 10 | ② | XPP-10010 | NLW10-10 | TT12X10 | ML10-15 | TE-1114 | |
| C3 | 5 | 10 | ③ | XPP-10005 | NLW5-15 | TT12X5 | ML5-15 | TE-1127 | |
| C4 | 10 | 10 | ② | XPP-10010 | NLW10-10 | TT12X10 | ML10-15 | TE-1114 | |
| C5 | 10 | 10 | ② | XPP-10010 | NLW10-10 | TT12X10 | ML10-15 | TE-1114 | |
| C6 | 50 | 7 | 581030 | XPP-10050 | NLW50-10 | TT10X50 | ML50-15 | TE-1119 | |

① Some versions may use 100mfd @ 25V (Part #581014).
② Some versions may use 10mfd @ 12V (Part #581022).
③ Some versions may use 5mfd @ 12V (Part #581025).

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C7 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C8 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C9 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C10 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C11 | 4. 7 NPO 10% | | NPO-DI 4. 7 | DTZ-4R7 | C10V47C | CCTO-4R7 | CNO-547 | 10TCC-V47 |
| C12 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C13 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C14 | 4. 7 NPO 10% | | NPO-DI 4. 7 | DTZ-4R7 | C10V47C | CCTO-4R7 | CNO-547· | 10TCC-V47 |
| C15 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C16 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | GP120 | 5HK-S20 |
| C17 | 2000 | | BPD-002 | DD-202 | BYA10D2 | CCD-202 | GP220 | 5HK-D20 |
| C18 | 20000 | | BPD-02 | DD-203 | BYA10S2 | CCD-202 | GP120 | 5HK-S20 |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | ROLAND PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 1meg | ½ | 36041l | B-11 | | Q13-114 | U12 | Volume |
| B | Switch | | | KR-1 | | 76-1 | US-26 | Power On-Off |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R2 | 33K 5% | |
| R3 | 18K | |
| R4 | 3900Ω | |
| R5 | 47Ω | ① |
| R6 | 2400Ω 5% | (2200Ω) * |
| R7 | 270Ω | |
| R8 | 4700Ω | |
| R9 | 47K | |

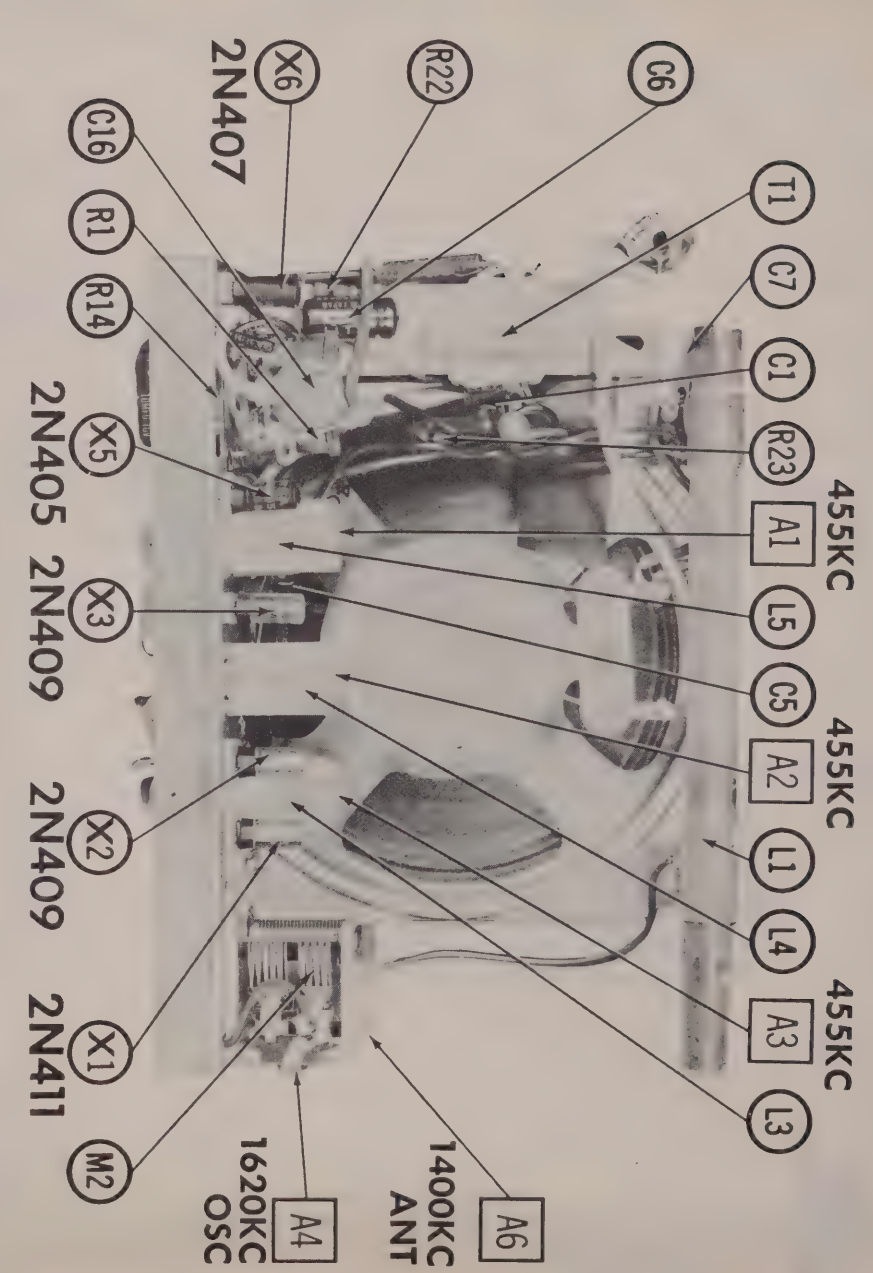
| ITEM No. | RATING | REMARKS |
|---|---|---|
| R10 | 18K | |
| R11 | 2400Ω 5% | (2200Ω) * |
| R12 | 2400Ω 5% | (2200Ω) * |
| R13 | 100K | |
| R14 | 3300Ω | |
| R15 | 1meg | |
| R16 | 68K | |
| R17 | 10K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R18 | 3900Ω | |
| R19 | 1000Ω | |
| R20 | 4700Ω | |
| R21 | 1500Ω 5% | |
| R22 | 100Ω | |
| R23 | 100Ω | |

① Not used in some versions.

* Alternate Value.

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | ROLAND PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Loopstick | 464022 | | | | | | |
| L2 | Osc. Coil | 455062 | | | | | | |
| L3 | 1st IF Trans. | 450018 | 16-9003 | 16-9003 | BC-324 | 2041 | | |
| L4 | 2nd IF Trans. | 450018 | 16-9003 | 16-9003 | BC-325 | 2041 | | |
| L5 | 3rd IF Trans. | 450019 | 16-9014 | 16-9014 | BC-326 | 2042 | | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | ROLAND PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 700Ω | 3-4Ω | 430410 | TR115 ① | | | TA-43① | TR115 ① | TY-45X① | ① Use original frame. |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | ROLAND PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3-4Ω | 404014 | 4A07 | |

## BATTERIES

| ITEM No. | VOLTAGE | ROLAND PART No. | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | BURGESS | | EVEREADY | | MALLORY | | |
| | | | "A" | "B" | "A" | "B" | "A" | "B" | |
| M1 | 1.5V | | | Z | | 1015 | | M-15R | Six required |

## MISCELLANEOUS

| ITEM No. | PART NAME | ROLAND PART No. | NOTES |
|---|---|---|---|
| M2 | Tuning Cap. Earphone | 590043 TEP | 2 Gang (Ant. 7-137mmf, Osc. 10-90mmf) |

## CABINETS & CABINET PARTS

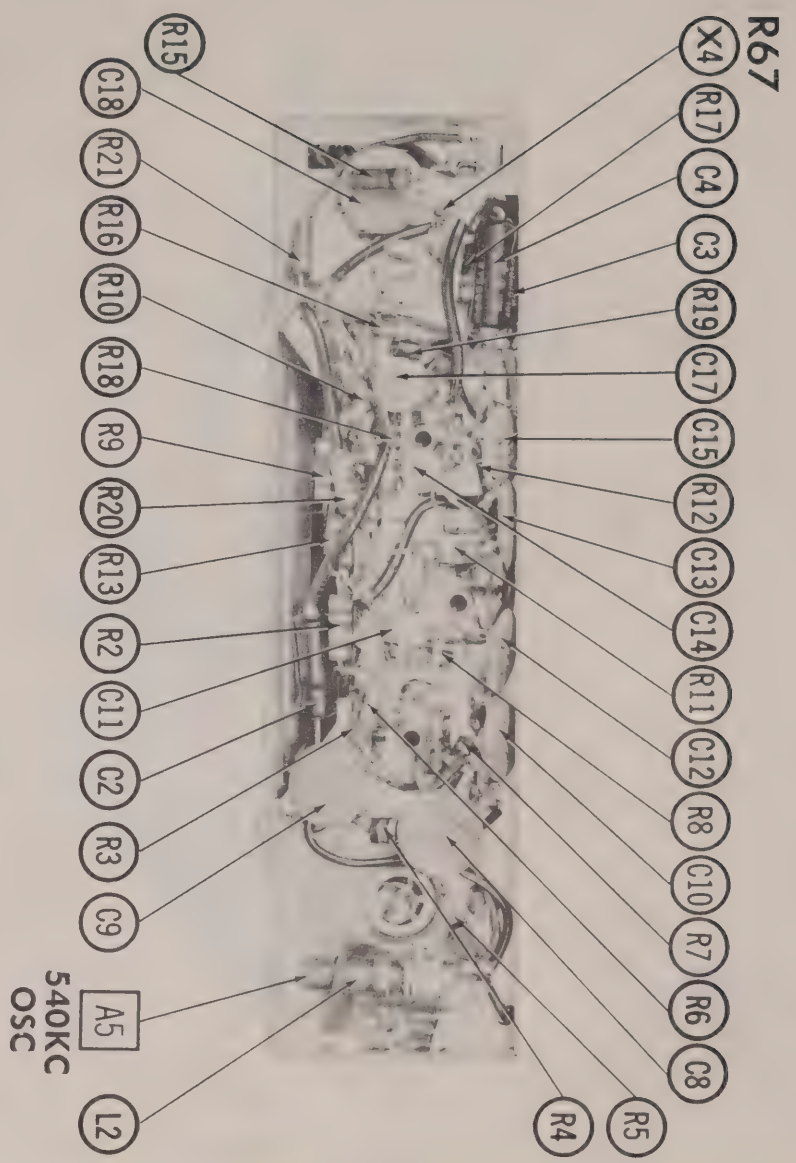
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

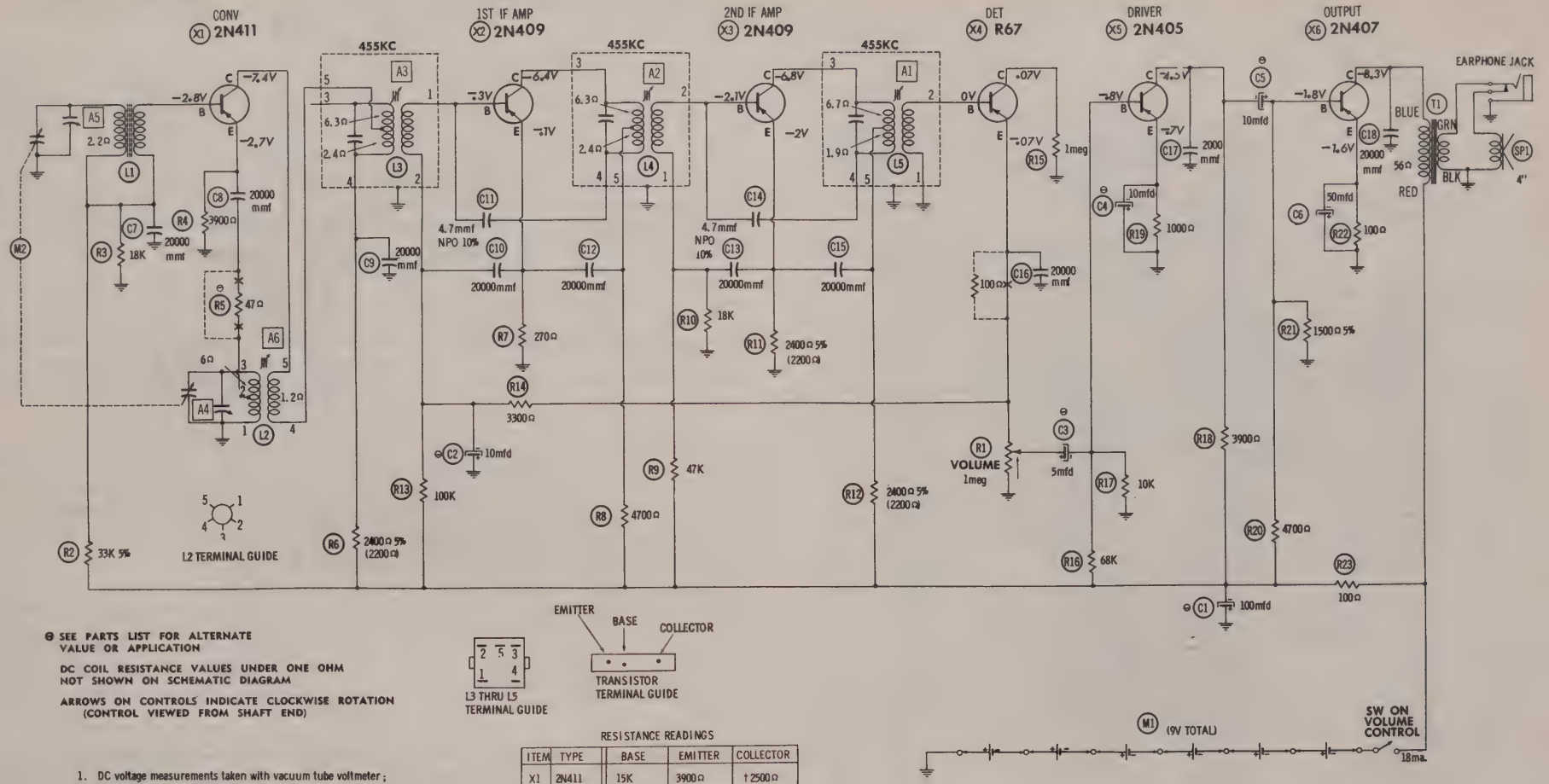
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 372238 | Tuning |
| Knob | 272237 | Volume |
| Cabinet Front | 250130 | White |
| Cabinet Front | 250132 | Black |
| Cabinet Back | 250131 | White |
| Cabinet Back | 250133 | Black |
| Handle | 790086 | |

## WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

# CHASSIS—BOTTOM VIEW






⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter;
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

| ITEM | TYPE | BASE | EMITTER | COLLECTOR |
|---|---|---|---|---|
| X1 | 2N411 | 15K | 3900Ω | †2500Ω |
| X2 | 2N409 | 4500Ω | 270Ω | †4800Ω |
| X3 | 2N409 | 18K | 2400Ω | †2500Ω |
| X4 | | | | |
| X5 | 2N405 | 10K | 1000Ω | †4000Ω |
| X6 | 2N407 | 1500Ω | 100Ω | †56Ω |

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R23 AND T1.
X4 CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

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**ROLAND MODEL 61-482 (5TR)**

PHOTOFACT® Folder

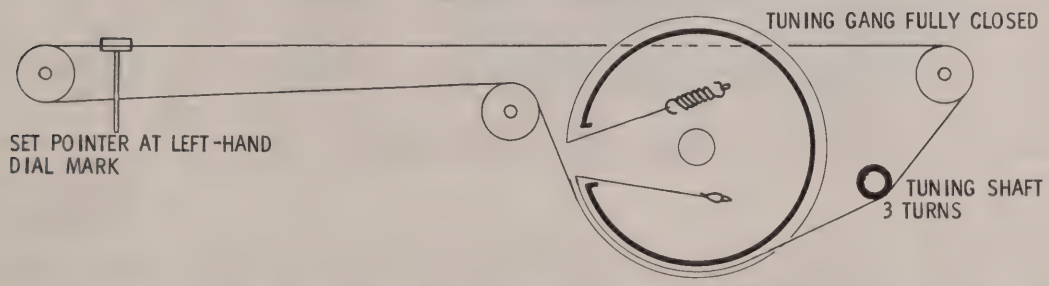
# SHERWOOD MODEL S-3000 II

SHERWOOD MODEL S-3000 II

SHERWOOD MODEL S-3000 II

| | | | |
|---|---|---|---|
| TRADE NAME | Sherwood Model S-3000 II | | |
| MANUFACTURER | Sherwood Electronic Laboratories, Inc., 4300 N. California Ave., Chicago 18, Illinois | | |
| TYPE SET | AC Operated 10 Tube FM Tuner | | |
| POWER SUPPLY | 110-120 Volts AC, 50-60 Cycles | RATING | 41 Watts, .42 Amp. @ 117 Volts AC |
| TUNING RANGE | FREQ. MOD. 88 - 108MC | | |

## DIAL CORD STRINGING

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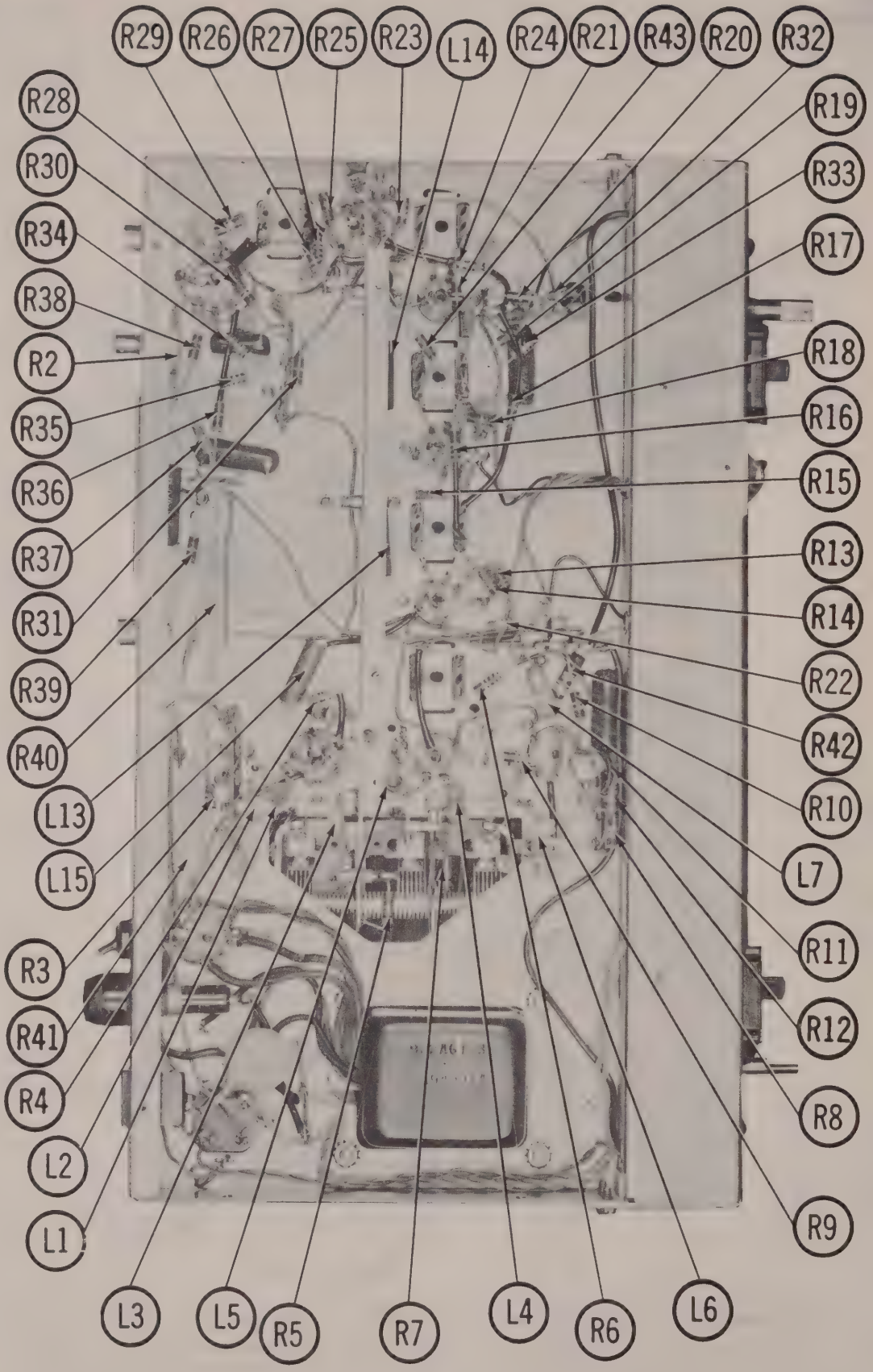
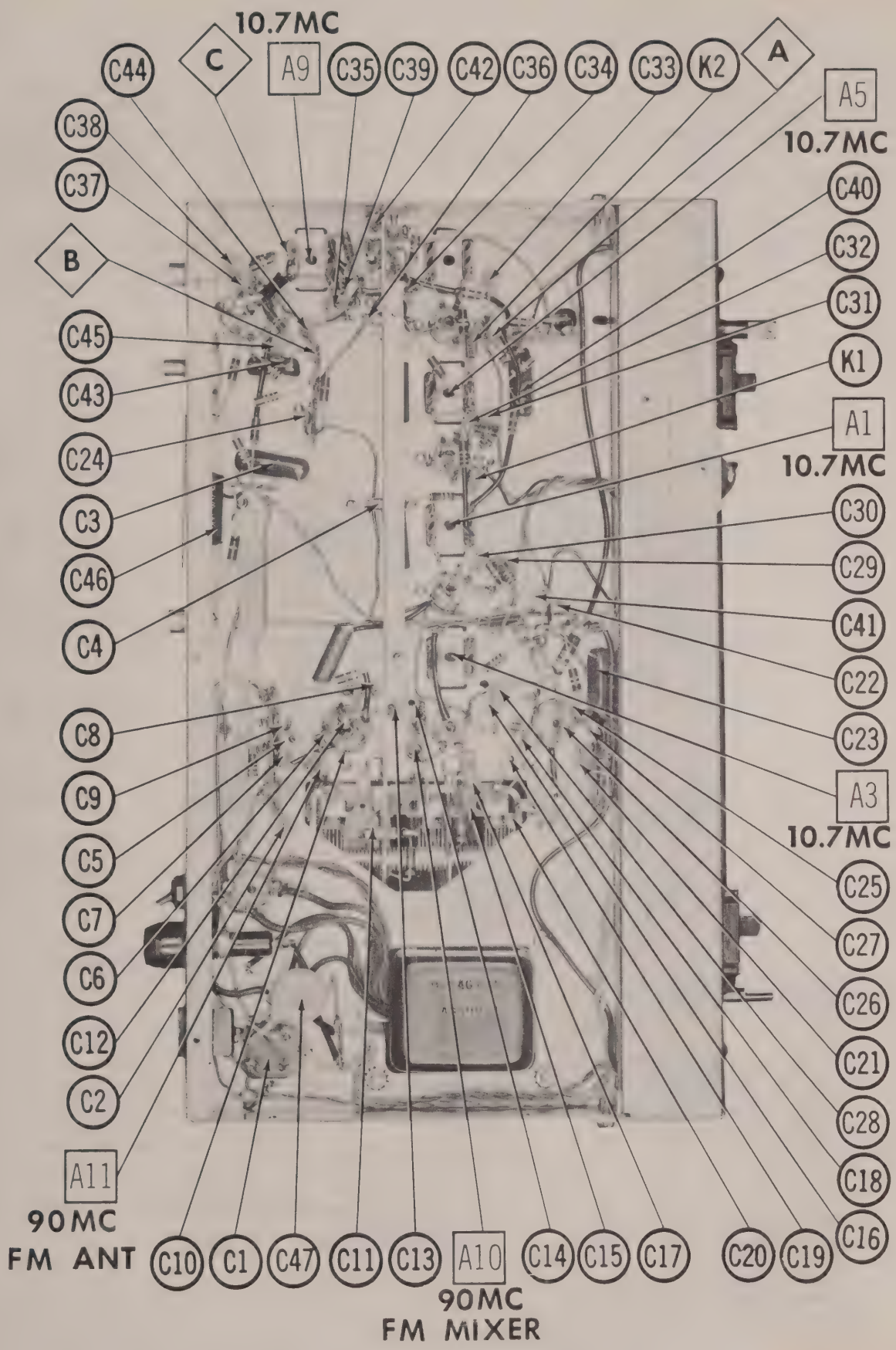
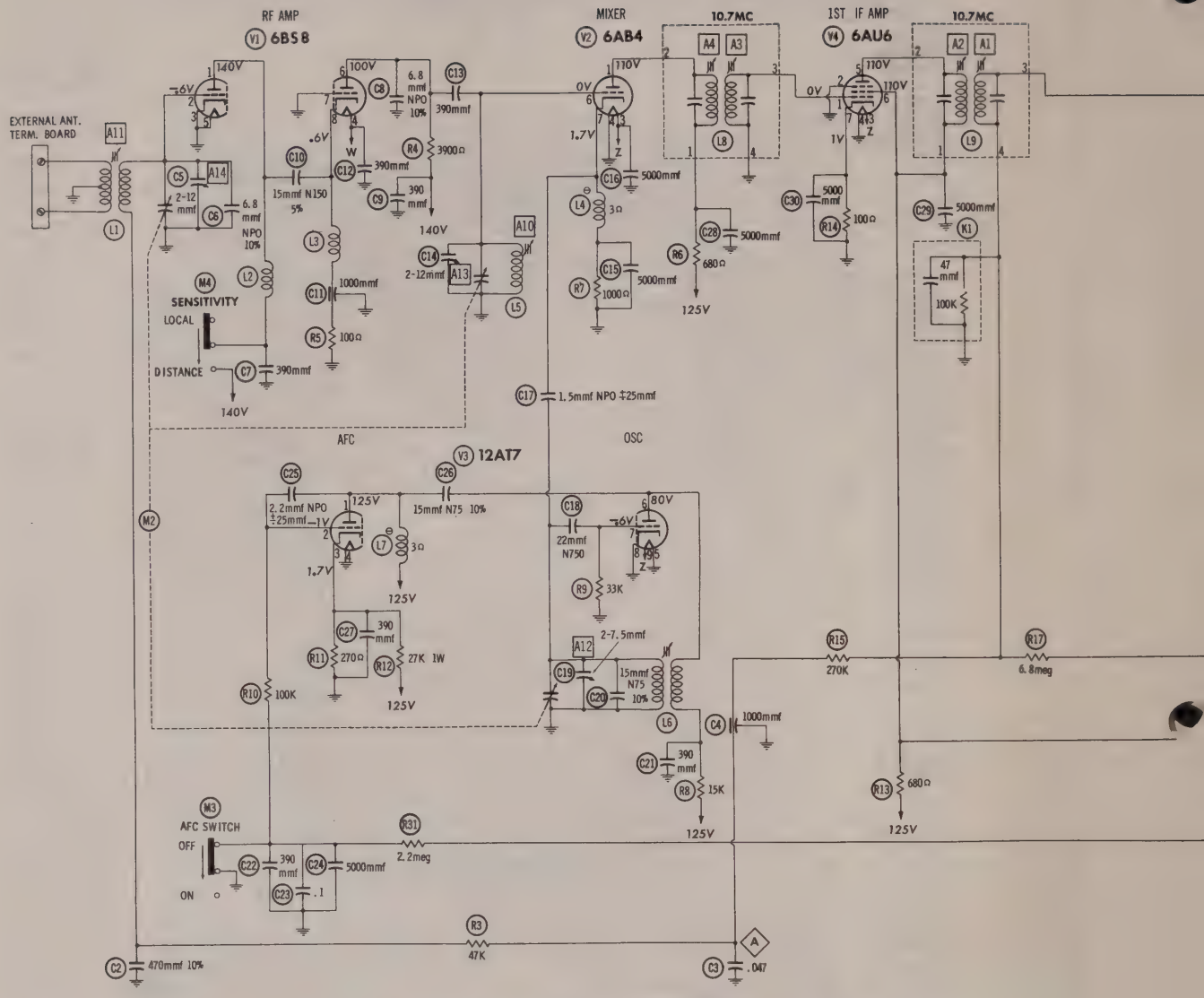



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION




CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR & MISC. IDENT.




NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

**DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM**

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 6BS8 | ■ †470Ω | 420K | 0Ω | .1Ω | 0Ω | †4400Ω | 0Ω | 100Ω | 0Ω |
| V2 | 6AB4 | †1600Ω | 0Ω | .1Ω | 0Ω | TP | 0Ω | 1000Ω | | |
| V3 | 12AT7 | †940Ω | ▲100K 2.6meg | 270Ω | 0Ω | 0Ω | †15K | 33K | 0Ω | .1Ω |
| V4 | 6AU6 | .3Ω | 0Ω | .1Ω | 0Ω | †1600Ω | †1600Ω | 100Ω | | |
| V5 | 6AU6 | 100K | 0Ω | .1Ω | 0Ω | †2300Ω | †2300Ω | 100Ω | | |
| V6 | 6AU6 | 150K | 0Ω | .1Ω | 0Ω | †100K | †100K | 0Ω | | |
| V7 | EM80 6BR5 | 1.5meg | 0Ω | †0Ω | 0Ω | .1Ω | NC | †470K | †0Ω | †0Ω |
| V8 | 6CM8 | †300K | 150K | 0Ω | 0Ω | .1Ω | †5600Ω | †5600Ω | 8000Ω | 1meg |
| V9 | 6BN8 | 100K | 0Ω | 200K | 0Ω | .1Ω | 100K | †1900Ω | 760K | 15K |
| V10 | 6X4 | 110Ω | 0Ω | 0Ω | .1Ω | NC | 115Ω | ¶ | | |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V10.
▲ MEASURED IN "AFC" POSITION.
■ MEASURED IN "DISTANT" POSITION.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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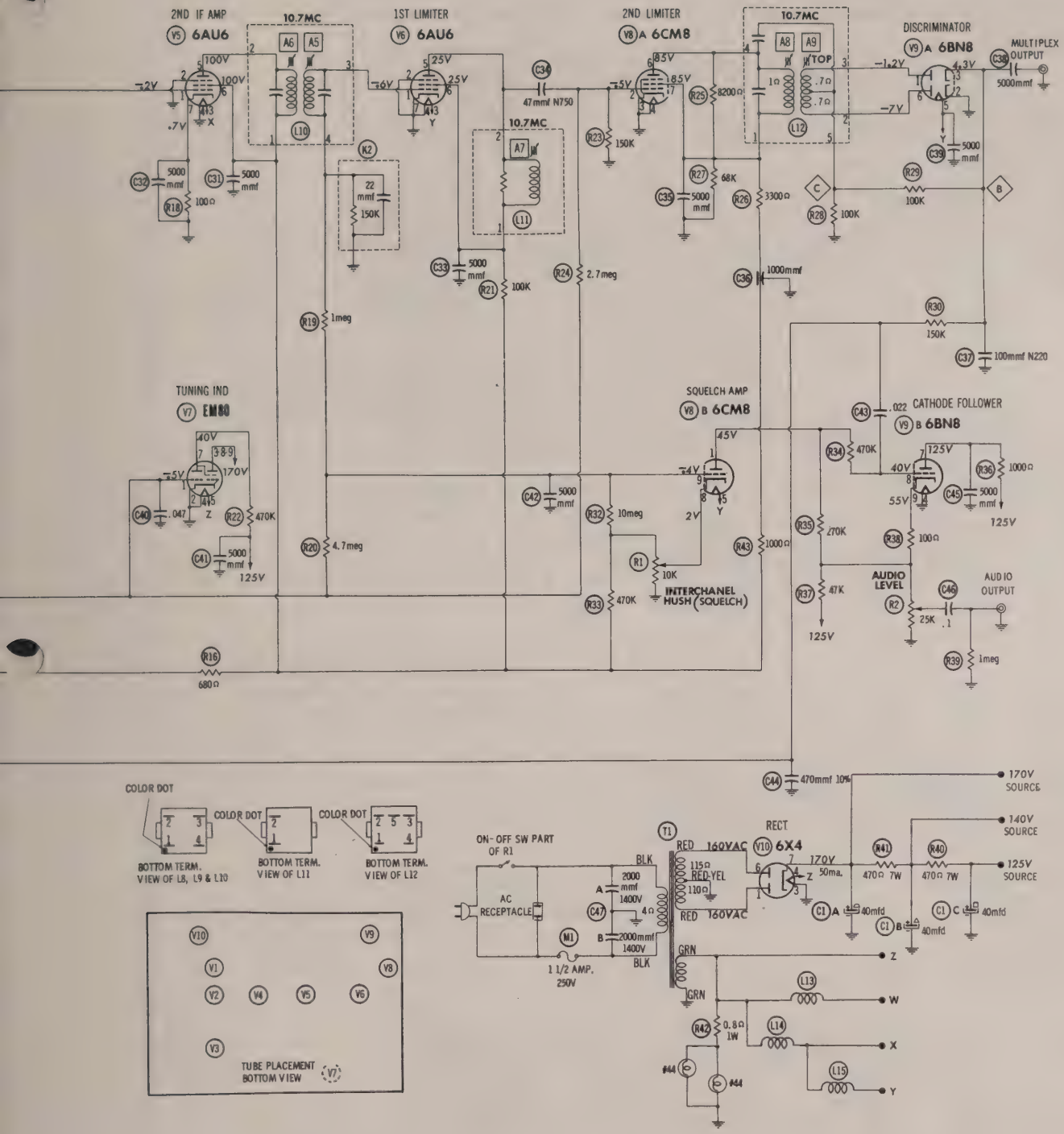



SHERWOOD MODEL
S-3000 II

# ALIGNMENT INSTRUCTIONS

**PRE-ALIGNMENT INSTRUCTIONS**

Audio Level should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A11 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
A12 thru A14 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

AFC off. Local - Distant switch on Distant.

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | High side thru .01mfd to pin 6 (grid) of Mixer. Low side to chassis. | 10.7MC (Unmod.) | Point of non-interference | DC probe to point (A). Common to chassis. | A1, A2, A3, A4 | Adjust for maximum deflection. |
| 2. | " | " | " | DC probe thru 100K to point (B). Common to chassis. | A5, A6, A7, A8 | " |
| 3. | " | " | " | DC probe thru 100K to point (C). Common to chassis. | A9 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

AFC off. Local - Distant switch on Distant.
Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 1. | High side thru .01mfd to pin 6 (grid) of Mixer. Low side to chassis. | 10.7MC (450KC Swp) | Point of non-interference | Vert. Amp. to point (B). Low side to chassis. | A1, A2, A3, A4, A5, A6, A7, A8 | Adjust for maximum gain and symmetry of response similar to Fig. 1. |
| 2. | " | " | " | Vert. Amp. thru 100K to point (C). Low side to chassis. | A9 | Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines. |

RF ALIGNMENT

| | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|
| 4. | Across FM antenna terminals with 120Ω in each lead. | 90MC (400~ FM) | 90MC | Across Audio Output thru AC probe. | A10, A11, L6 | Adjust for maximum deflection. |
| 5. | " | 106MC | 106MC | " | A12, A13, A14 | Adjust for maximum deflection. Repeat steps 4 and 5. |

FIG. 1

FIG. 2

# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
|---|---|---|---|---|---|
| V1 | RF Amplifier | 6BS8 | V7 | Tuning Indicator | EM80/6BR5 |
| V2 | Mixer | 6AB4 | V8 | 2nd Limiter - Squelch Amplifier | 6CM8 |
| V3 | AFC - Osc. | 12AT7 | V9 | Discriminator - Cathode Follower | 6BN8 |
| V4 | 1st IF Amplifier | 6AU6 | V10 | Rectifier | 6X4 |
| V5 | 2nd IF Amplifier | 6AU6 | | | |
| V6 | 1st Limiter | 6AU6 | | | |

## ELECTROLYTIC CAPACITORS

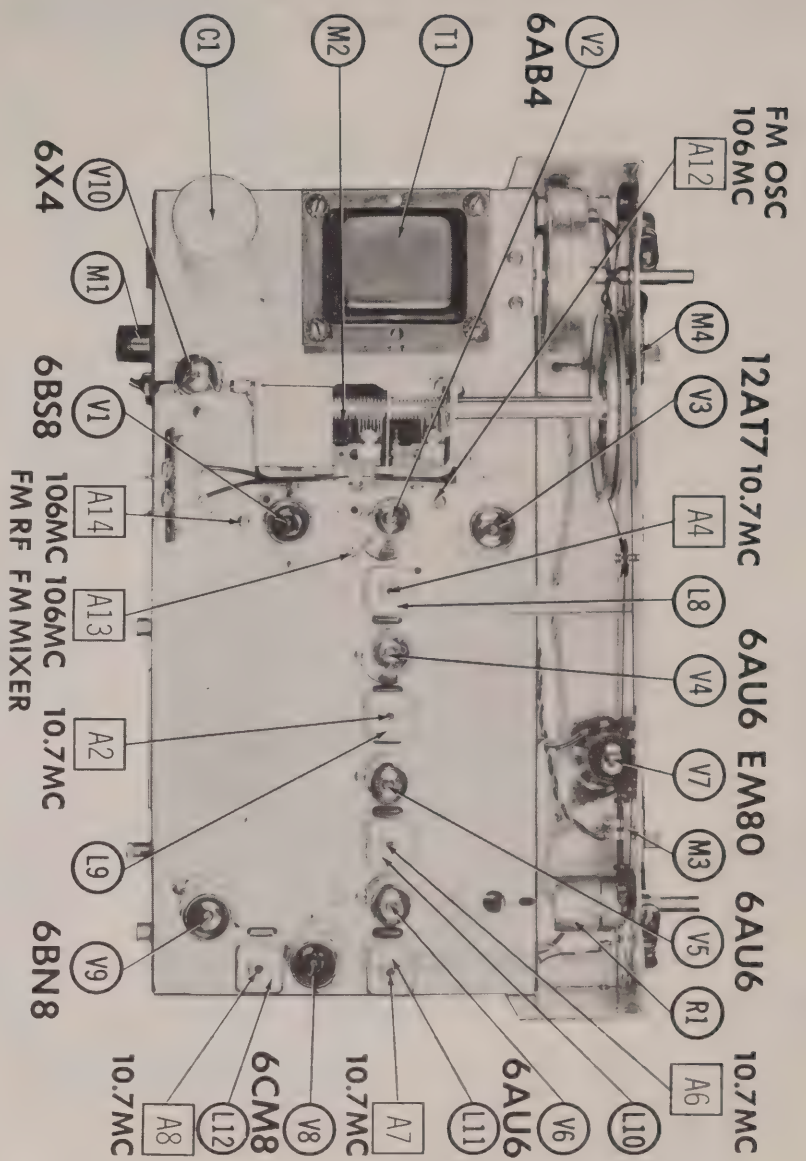
| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA SHERWOOD PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ▲40 | 300 | 120AD1 | AFH4-02 | D0020 | FP327.89 | TMQ-3 | TVLS-3639.14 | |
| B | ▲40 | 300 | | | | | | | |
| C | ■40 | 300 | | | | | | | |

## FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING | | | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|---|---|
| C2 | 470 | | 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C3 | .047 | 400V | | | P488N-047 | DD-503 | CUB4S47 | 4DP-3-473 | GEM-4147 | 4TM-S47 |
| C4 | 1000 | | | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C5 | 2-12 | | | | | | | | | |
| C6 | 6.8 | NPO | 10% | | NPO-DI 6.8 | DTZ-6R8 | C10V68C | CCTO-6R8 | CNO-568 | 10TCC-V68 |
| C7 | 390 | | | | DI-390 | DD-391 | L10T39 | CCD-391 | GP339 | 10TS-T39 |
| C8 | 6.8 | NPO | 10% | | NPO-DI 6.8 | DTZ-6R8 | C10V68C | CCTO-6R8 | CNO-568 | 10TCC-V68 |
| C9 | 390 | | | | DI-390 | DD-391 | L10T39 | CCD-391 | GP339 | 10TS-T39 |
| C10 | 15 | N150 | 5% | | | | | * | | 10TCP-Q15 |
| C11 | 1000 | | | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C12 | 390 | | | | DI-390 | DD-391 | L10T39 | CCD-391 | GP339 | 10TS-T39 |
| C13 | 390 | | | | DI-390 | DD-391 | L10T39 | CCD-391 | GP339 | 10TS-T39 |
| C14 | 2-12 | | | | | | | | | |
| C15 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C16 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C17 | 1.5 | NPO | .25mmf | | NPO-DI 1.5 | DTZ-1R5 | C10V15C | | CNO-515 | 10TCC-V15 |
| C18 | 22 | N750 | | | N750-DI 22 | DTN-22 | C10Q22U | CCTN-220 | CN7-220 | 10TCU-Q22 |
| C19 | 2-7.5 | | | | | 829-7 | | | | |
| C20 | 15 | N75 | 10% | | | | | | | |
| C21 | 390 | | | | DI-390 | DD-391 | L10T39 | CCD-391 | GP339 | 10TS-T39 |
| C22 | 390 | | | | DI-390 | DD-391 | L10T39 | CCD-391 | GP339 | 10TS-T39 |
| C23 | .1 | 200V | | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |
| C24 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C25 | 2.2 | NPO | .25mmf | | NPO-DI 2.2 | DTZ-2R2 | C10V22C | CCTO-2R2 | CNO-522 | 10TCC-V22 |
| C26 | 15 | N75 | 10% | | | | | | | |
| C27 | 390 | | | | DI-390 | DD-391 | L10T39 | CCD-391 | GP339 | 10TS-T39 |
| C28 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C29 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C30 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C31 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C32 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C33 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C34 | 47 | N750 | | | N750-DI 47 | DTN-47 | C10Q47U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C35 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C36 | 1000 | | | | EF-001 | MFT-1000 | | CCF-102 | CT280A | |
| C37 | 100 | N220 | | | | | | * | | 10TCR-T10 |
| C38 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C39 | 5000 | | | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C40 | .047 | 400V | | | P488N-047 | DD-503 | CUB4S47 | 4DP-3-503 | GEM-4147 | 4TM-S47 |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## FIXED CAPACITORS (cont)

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C41 | 5000 | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C42 | 5000 | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C43 | .022 400V | | P488N-022 | DD-203 | CUB4S22 | 4DP-2-223 | GEM-4122 | 4TM-S22 |
| C44 | 470 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C45 | 5000 | | BPD-005 | DD-502 | BYA10D5 | CCD-502 | GP250 | 5HK-D50 |
| C46 | .1 200V | | P288N-1 | DF-104 | CUB2P1 | 2DP-3-104 | GEM-201 | 2TM-P1 |
| C47A | 2000 1400V | | HVD-30-2200 | DD30-202 | HVC20D2 | 3CCD-202 | 2HV-222 | 30GA-D20 |
| B | 2000 1400V | | HVD-30-2200 | DD30-202 | HVC20D2 | 3CCD-202 | 2HV-222 | 30GA-D20 |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | SHERWOOD PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 10K | ½ | 670AD4 | B-26 Not Req. | A47-25K-S FKS-1/4 | B11-120 TM2 | TA253L Not Req. | Interchannel Hush (Squelch) Power (Push-Push) Audio Level |
| B | Switch | | | | | | | |
| R2A | 25K | ½ | | | | | | |
| B | Shaft | | | | | | | |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R3 | 47K | |
| R4 | 3900Ω | |
| R5 | 100Ω | |
| R6 | 680Ω | |
| R7 | 1000Ω | |
| R8 | 15K | |
| R9 | 33K | |
| R10 | 100K | |
| R11 | 270Ω | |
| R12 | 27K 1W | |
| R13 | 680Ω | |
| R14 | 100Ω | |
| R15 | 270K | |
| R16 | 680Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R17 | 6.8meg | |
| R18 | 100Ω | |
| R19 | 1meg | |
| R20 | 4.7meg | |
| R21 | 100K | |
| R22 | 470K | |
| R23 | 150K | |
| R24 | 2.7meg | |
| R25 | 8200Ω | |
| R26 | 3300Ω | |
| R27 | 68K | |
| R28 | 100K | |
| R29 | 100K | |
| R30 | 150K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R31 | 2.2meg | |
| R32 | 10meg | |
| R33 | 470K | |
| R34 | 470K | |
| R35 | 270K | |
| R36 | 1000Ω | |
| R37 | 47K | |
| R38 | 100Ω | |
| R39 | 1meg | |
| R40 | 470Ω 7W | |
| R41 | 470Ω 7W | |
| R42 | 0.8Ω 1W | |
| R43 | 1000Ω | |

## COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | SHERWOOD PART No. | REPLACEMENT DATA |
|---|---|---|---|---|
| K1 | 1st Limiter Grid | 47mmf, 100K | | |
| K2 | 2nd Limiter Grid | 22mmf, 150K | | |

## COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | SHERWOOD PART No. | Gramer PART No. | Meissner PART No. | Merit PART No. | Miller PART No. | Ram PART No. | |
| L1 | Ant. Trans. | | | | | | | |
| L2 | RF Choke | | 19-1000 | 19-1000 | BC-561 | 4602 | | 1uh |
| L3 | Cathode Choke | | 19-1000 | 19-1000 | BC-561 | 4602 | | 1uh |
| L4 | Cathode Choke | | 19-1003 | 19-1003 | BC-564 | 4608 | | 3.9uh ① |
| L5 | RF Coil | | | | | | | |
| L6 | Osc. Coil | | | | | | | |
| L7 | RF Choke | | 19-1003 | 19-1003 | BC-564 | 4608 | | 3.9uh ① |
| L8 | 1st IF Trans. | 55-364 | 16-3487 | 16-3487 | FM-254 | 1463 | | |
| L9 | 2nd IF Trans. | 59-154 | 16-3487 | 16-3487 | FM-254 | 1463 | | |
| L10 | 3rd IF Trans. | 59-154 | 16-3487 | 16-3487 | FM-254 | 1463 | | |
| L11 | 4th IF Trans. | 56-217 | | | | | | |
| L12 | Discriminator | 59-199 | 17-3494 | 17-3494 | FM-253 | 1464 | | |
| L13 | Fil. Choke | | 19-1002 | 19-1002 | SW-630 | 4606 | | |
| L14 | Fil. Choke | | 19-1002 | 19-1002 | SW-630 | 4606 | | |
| L15 | Fil. Choke | | 19-1002 | 19-1002 | SW-630 | 4606 | | |

① IRC Part #CLA

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SHERWOOD PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. |
| T1 | 117V ② .42A | 320VCT ② .050A | 6.3V ② 3.5A | 922AG1 | | | | | | |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | SHERWOOD PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M1 | 3AG | 1½A 250A | | | 31201.5 (3AG 1½A 250V) | 342001 | AGC 1½ | HKP |

## MISCELLANEOUS

| ITEM No. | PART NAME | SHERWOOD PART No. | NOTES |
|---|---|---|---|
| M2 | Tuning Cap. | | 2 Gang |
| M3 | Switch | | AFC Off-On (SPDT, Slide Type) |
| M4 | Switch | | Sensitivity, Local-Distant (SPDT, Slide Type) |

## WIRING DATA

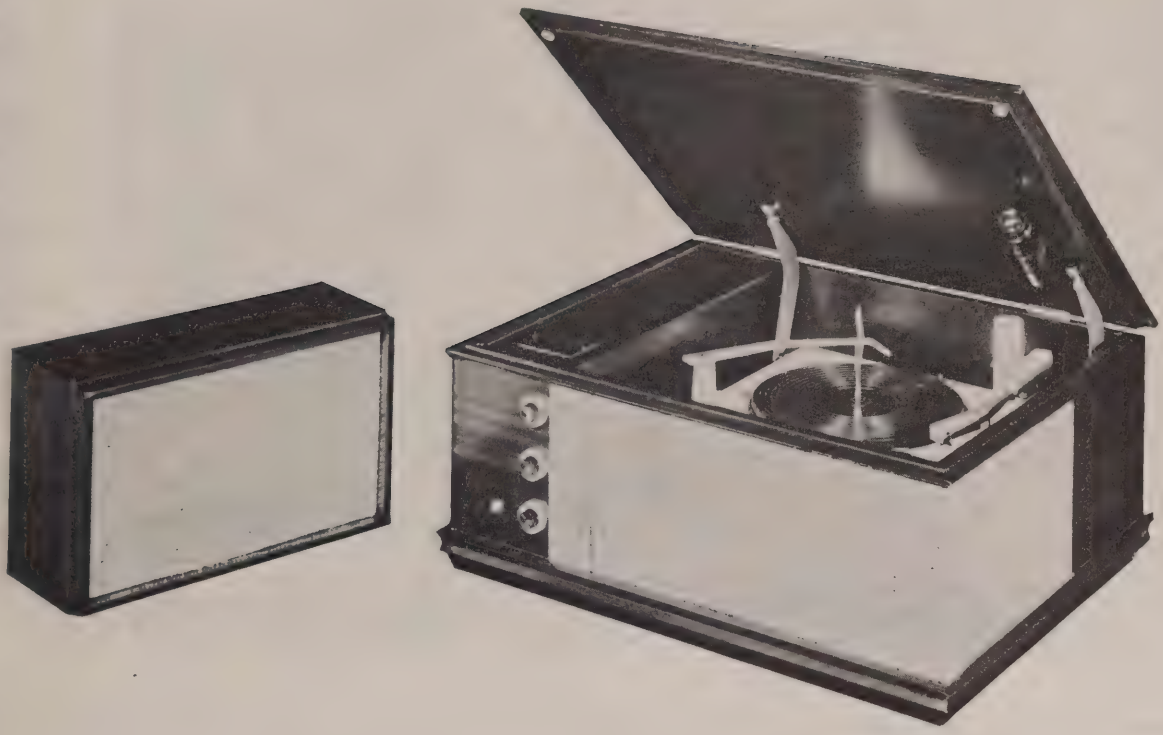
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

# SILVERTONE MODELS 263, 272, 273 (Ch. 528.59370, 528.59380)

SILVERTONE MODELS 263, 272, 273 (Ch. 528.59370, 528.59380)



SILVERTONE MODELS 263, 272, 273 (Ch. 528.59370, 528.59380)

| | |
|---|---|
| TRADE NAME | Silvertone Models 263 (Ch. 528.59370), 272, 273 (Ch. 528.59380) |
| SUPPLIER | Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois |
| TYPE SET | AC Operated 4 Tube Stereo Amplifier with 4 Speed Automatic Record Changer |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles RATING 30 Watts, .35 Amp. @ 117 Volts AC |

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR SILVERTONE 528.56300 - PHOTOFACT SET 417 FOLDER 10

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

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# PARTS LIST AND DESCRIPTIONS

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

## TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
|---|---|---|---|---|---|
| V1 | Left Channel AF Amp. -<br>Right Channel AF Amp. | 7025 | V3 | Left Channel Output | 50C5 |
| V2 | Left Channel AF Amp. -<br>Right Channel AF Amp. | 7025 | V4 | Right Channel Output | 50C5 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA SILVERTONE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | ▲150 | 150 | 18-40-3 | AFH3-26 | D0014 | FP240 | TMD-13 | TVLS-3449.1* | |
| B | ▲50 | 150 | | | | TC495 | TD-150-150 | | |
| C | ■50 | 150 | | | | | | | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## FIXED CAPACITORS •

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

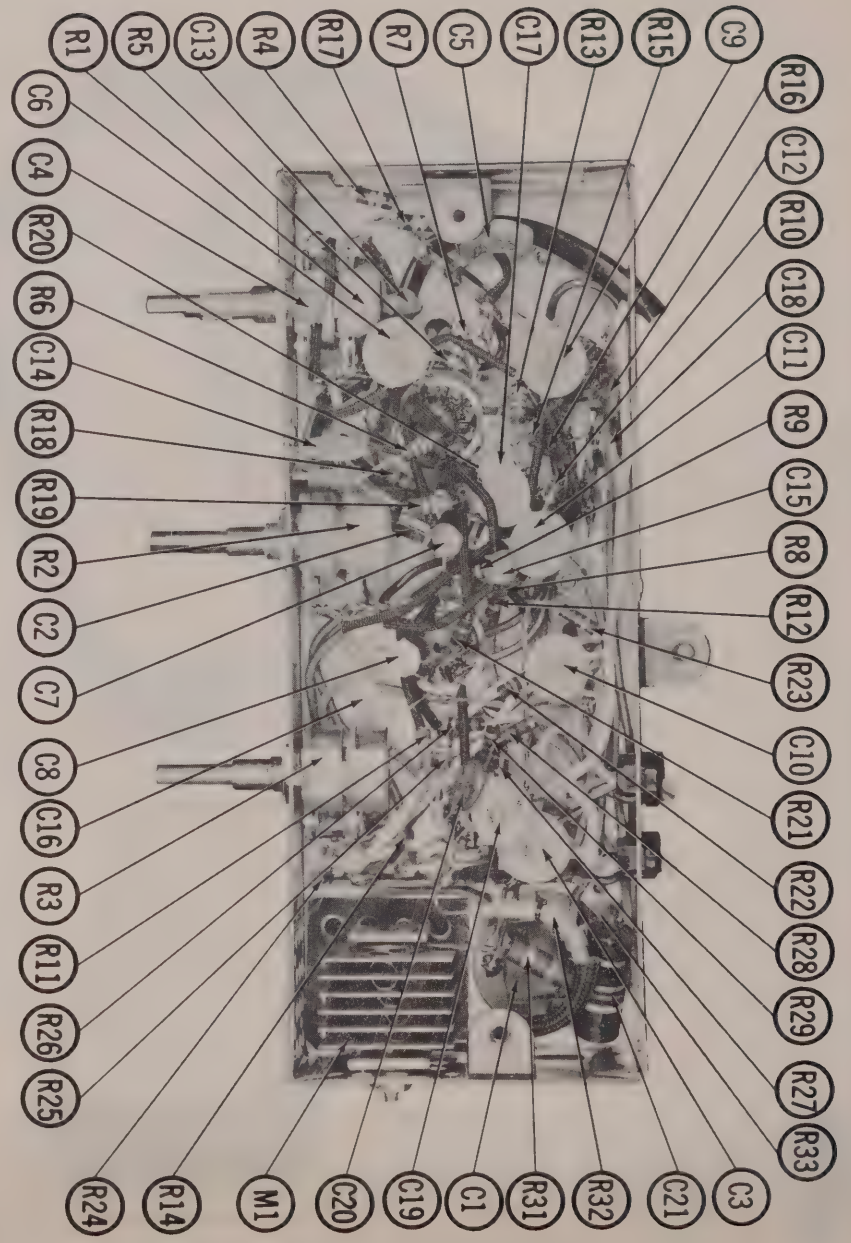
| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C2 | .047 400V | | P488N-047 | DD-503 | CUB4S47 | 4DP-3-473 | GEM-4147 | 4TM-S47 |
| C3 | 20000 1000V | | BPD-02 | | CUB10S2 | 16DP-4-203 | B-120 | 5HK-S20 |
| C4 | 47 N750 10% | | N750-DI 47 | DTN-47 | C10Q47U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C5A | 5000 | | | | | CCD-502 | | |
| B | 5000 | | BPD-2X0047 | DD3-502 | BYD6DD5 | CCD-502 | B2X250 | 5HK-2D47 |
| C6 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | B-120 | 5HK-S20 |
| C7 | 100 N2200 10% | #15-10111 | | | | * | | 30TCY-T10 |
| C8 | 750 10% | | DI-750 | DD-751 | 1R5T75 | CCD-751 | GP375 | 10TS-T75 |
| C9 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | B-120 | 5HK-S20 |
| C10 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | B-120 | 5HK-S20 |
| C11 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | B-120 | 5HK-S20 |
| C12 | 6000 | | DAC-22 | DD16-602 | HVE16D6 | 6DP-1-602 | B-260 | 6TM-D6 |
| C13 | 47 N750 10% | | N750-DI 47 | DTN-47 | C10Q47U | CCTN-470 | CN7-447 | 10TCU-Q47 |
| C14 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | B-120 | 5HK-S20 |
| C15 | 100 N2200 10% | #15-10111 | | | | * | | 30TCY-T10 |
| C16 | 750 10% | | DI-750 | DD-751 | 1R5T75 | CCD-751 | GP375 | 10TS-T75 |
| C17 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | B-120 | 5HK-S20 |
| C18 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | B-120 | 5HK-S20 |
| C19 | 20000 | | BPD-02 | DD-203 | BYB6S2 | CCD-203 | B-120 | 5HK-S20 |
| C20 | 6000 | | DAC-22 | DD16-602 | HVE16D6 | 6DP-1-602 | B-260 | 6TM-D6 |
| C21 | .047 400V | | P488N-047 | DD-503 | CUB4S47 | 4DP-3-473 | GEM-4147 | 4TM-S47 |

\# Silvertone Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA SILVERTONE PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 2meg<br>900K tap | ½ | 24-332-0 | | | | | Loudness, Left Channel |
| B | 2meg<br>900K tap | ½ | | | | | | Loudness, Right Channel |
| R2A | 500K | ½ | 24-183-2 | AB-60 | AD47-500K-Z | Q13-133 | | Treble, Left Channel |
| B | 500K | ½ | | SR-60 | Not Req. | M13-133 | | Treble, Right Channel |
| C | Shaft | | | AK-8 | RS-3/16 | NQ | | |
| R3A | 500K | ½ | 24-183-2 | AB-60 | AD47-500K-Z | Q13-133 | | Bass, Left Channel |
| B | 500K | ½ | | SR-60 | Not Req. | M13-133 | | Bass, Right Channel |
| C | Shaft | | | AK-8 | RS-3/16 | NQ | | |

# CHASSIS—BOTTOM VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 100K | |
| R5 | 1meg | |
| R6 | 270K | |
| R7 | 4700Ω | |
| R8 | 1meg | |
| R9 | 560K | |
| R10 | 2200Ω | |
| R11 | 270K | |
| R12 | 2700Ω | |
| R13 | 470K | |
| R14 | 8200Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R15 | 1000Ω | |
| R16 | 150Ω | |
| R17 | 100K | |
| R18 | 1meg | |
| R19 | 270K | |
| R20 | 4700Ω | |
| R21 | 1meg | |
| R22 | 560K | |
| R23 | 2200Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R24 | 8200Ω | |
| R25 | 270K | |
| R26 | 2700Ω | |
| R27 | 470K | |
| R28 | 1000Ω | |
| R29 | 150Ω | |
| R30 | 220Ω | |
| R31 | 2700Ω 1W | |
| R32 | 27Ω 2W | |
| R33 | 22K | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | SILVERTONE PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2700Ω | 6-8Ω | 80-78-1 | 22S86 | A-2902① | AU-604① | A-3849① | 22S86 | | ① Drill new mounting hole |
| T2 | 2700Ω | 6-8Ω | 80-78-1 | 22S86 | A-2902① | AU-604① | A-3849① | 22S86 | | |

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | SILVERTONE PART No. | QUAM PART No. | |
| SP1 | 6" x 9" | PM | 6-8Ω | 33-394-4 ① | 69A1Z9.3 | ① Models 272, 273 |
| SP2 | 6" x 9" | PM | 6-8Ω | 33-394-4 ① | 69A1Z9.3 | ② Model 263 |
| | 6" | PM | 6-8Ω | 33-386-4 ② | | |
| | 6" | PM | 6-8Ω | 33-386-4 ② | | |

## RECTIFIERS

| ITEM No. | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|
| | CURRENT (Measured) | SILVERTONE PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | NOTES |
| M1 | .042A | 86-15-3 ① | RS150 ① | 1235AH ① | 150 ① | SR200 ② | ① Selenium Type ② Silicon Type |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | SILVERTONE PART No. | ASTATIC PART No. | | ELECTRO-VOICE PART No. | | JENSEN PART No. | | SONOTONE PART No. | |
| | | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE |
| M2 | 33-311-0 | 13TB | Not Req. | 26 | Not Req. | | | 10T2-S | Not Req. |

## PHONO NEEDLE

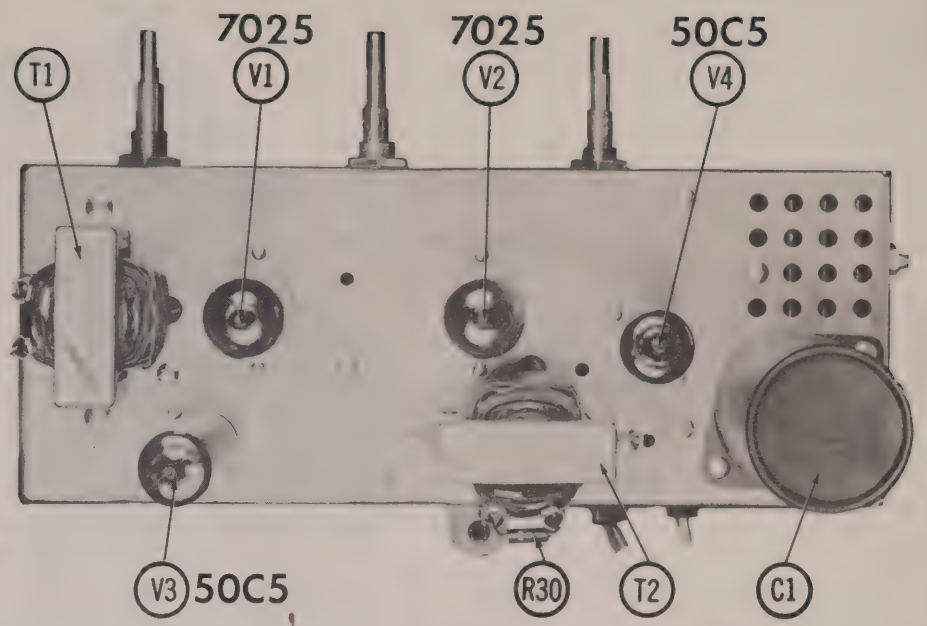
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA | | | REMARKS |
|---|---|---|---|---|
| | SILVERTONE PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | |
| M3 | 83-1250 † (78RPM) | W-101TS † or W-101STD ♦ | E98 † or E98D ♦ | † Jewel ♦ Diamond |
| | 83-1252 † (LP) | W-102MGS † or W-102MGD ♦ | E98X † or E98XD ♦ | |

## MISCELLANEOUS

| ITEM No. | PART NAME | SILVERTONE PART No. | NOTES |
|---|---|---|---|
| M4 | Switch | | Stereo-Monaural (Part of Changer) (DPDT, Slide Type) |
| M5 | Switch | 84-6552 | Off-On (Part of Changer) |
| M6 | Solenoid | 27-71-2 | Reject (Part of Changer, Ch. 528.56700, 528.56701) |
| M7 | Motor | 59-72 | Complete (Part of Changer, Ch. 528.56700, 528.56660) |
| | Motor | 59-89 | Complete (Part of Changer, Ch. 528.56701, 528.56661) |

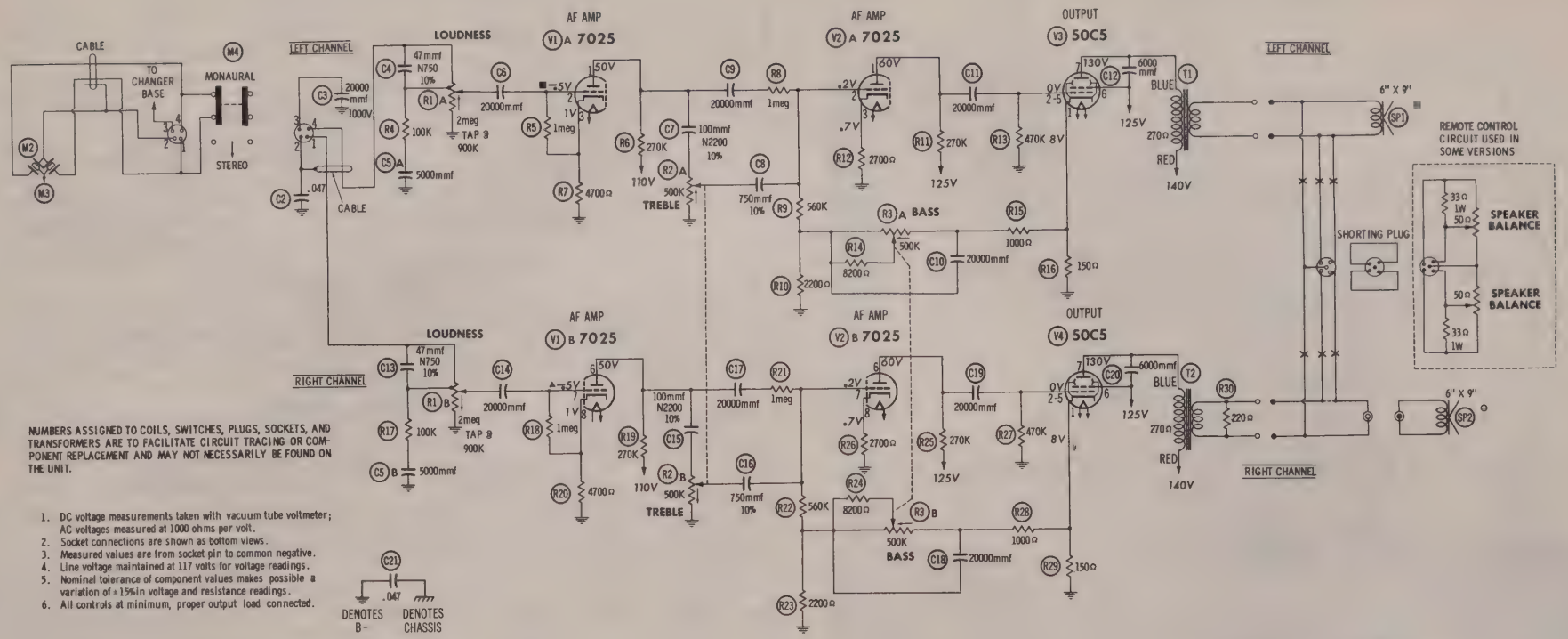
# CHASSIS—TOP VIEW




## CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 52-1267-0 | Loudness, Model 272, 273 |
| Knob | 52-1256-0 | Loudness, Model 263 |
| Knob | 52-1257-0 | Tone, Model 272, 273 |
| Knob | 52-1255-0 | Bass, Model 263 |
| Knob | 52-1254-0 | Treble, Model 263 |
| Knob | 52-1241-0 | Stereo Balance, Model 272, 273 |
| Knob | 52-1240-0 | Stereo Balance, Model 263 |
| Knob | 52-1237-0 | On-Off-Reject, Model 272, 273, 263 |
| Knob | 52-1238-0 | Speed Control, Model 272, 273, 263 |
| Cabinet | 42-100-2 | Model 272 |
| Cabinet | 42-101-2 | Model 273 |
| Cabinet | 42-99-2 | Model 263 |
| Cabinet Lid | 21-525-0 | Model 272 |
| Cabinet Lid | 21-526-0 | Model 273 |
| Cabinet | 42-32-4 | External Speaker, Model 272 |
| Cabinet | 42-33-4 | External Speaker, Model 273 |
| Handle | 49-517 | With Hardware, Model 263 |




NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

C21 .047 — DENOTES B− — DENOTES CHASSIS

RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 7025 | †295K | 1meg | 4700Ω | 12Ω | 0Ω | †295K | 1meg | 4700Ω | 6Ω |
| V2 | 7025 | †270K | 560K | 2700Ω | 12Ω | 24Ω | †270K | 560K | 2700Ω | 18Ω |
| V3 | 50C5 | 150Ω | 470K | 24Ω | 74Ω | 470K | †2700Ω | †270Ω | | |
| V4 | 50C5 | 150Ω | 470K | 74Ω | 125Ω | 470K | †2700Ω | †270Ω | | |

† MEASURED FROM OUTPUT OF M1.
■ MEASURED FROM PIN 3 OF V1.
▲ MEASURED FROM PIN 8 OF V1.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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**SILVERTONE MODELS 263, 272, 273 (Ch. 528.59370, 528.59380)**

PHOTOFACT® Folder

**TRAV-LER MODELS
1005, 1105**

TRAV-LER MODELS
1005, 1105

TRAV-LER MODELS
1005, 1105

| | |
|---|---|
| TRADE NAME | Trav-Ler Models 1005, 1105 |
| MANUFACTURER | Trav-Ler Radio Corp., 571 W. Jackson Blvd., Chicago 6, Illinois |
| TYPE SET | AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 110-125 Volts AC, 60 Cycles RATING 45 Watts, .48 Amp. @117 Volts AC |

FOR SERVICE INFORMATION ON RECORD CHANGER PART #RC-35 — SEE SIMILAR MONARCH UA8 — PHOTOFACT SET 381 FOLDER 11

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JT512

# PARTS LIST AND DESCRIPTIONS

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

## TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

| ITEM No. | USE | TYPE |
|---|---|---|
| V1 | Channel 1 AF Amp. -<br>Channel 2 AF Amp. | 12AX7 |
| V2 | Channel 1 Output | 50L6GT |
| V3 | Channel 2 Output | 50L6GT |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. | RATING VOLT. | REPLACEMENT DATA TRAV-LER PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1 | 20 | 300 | EC-70 | PRS1735 | BR2035 | TC65 | TD-20-350 | TVA-1608 | |
| C2A | ▲40 | 300 | EC-69 | AFH3-44 | CO350 | FP327, 89 | TMT-23 | TVL-3787 | |
| B | ■40 | 300 | | | | | | | |
| C | ▲40 | 300 | | | | | | | |

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
|---|---|---|---|---|---|---|---|---|
| C3 | .05 600V | | P688N-05 | DD-503 | CUB6S5 | 6DP-3-503 | GEM-615 | 6TM-S5 |
| C4 | 270 10% | | DI-270 | DD-271 | LI0T27 | CCD-271 | GP327 | 10TS-T27 |
| C5 | 680 10% | | DI-680 | DD-681 | 1R5T68 | CCS-681 | GP368 | 10TS-T68 |
| C6 | 2000 10% | | DI-2000 | | 1R5D2 | CCS-202 | GP202 | 10TS-D20 |
| C7 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C8 | 470 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C9 | .25 200V | | P288N-25 | | CUB2P25 | 2DP-4-254 | GEM-2025 | 2TM-P25 |
| C10 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | | 5HK-S10 |
| C11 | 2000 10% | | DI-2000 | | 1R5D2 | CCS-202 | GP202 | 10TS-D20 |
| C12 | 270 10% | | DI-270 | DD-271 | LI0T22 | CCD-271 | GP327 | 10TS-T27 |
| C13 | 680 10% | | DI-680 | DD-681 | 1R5T68 | CCS-681 | GP368 | 10TS-T68 |
| C14 | 2000 10% | | DI-2000 | | 1R5D2 | CCS-202 | GP202 | 10TS-D20 |
| C15 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C16 | 470 10% | | DI-470 | DD-471 | 5R5T47 | CCD-471 | GP347 | 10TS-T47 |
| C17 | .25 200V | | P288N-25 | | CUB2P25 | 2DP-4-254 | GEM-2025 | 2TM-P25 |
| C18 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | B-110 | 5HK-S10 |
| C19 | 2000 10% | | DI-2000 | | 1R5D2 | CCS-202 | GP202 | 10TS-D20 |
| C20 | 2mfd 50V | | P1589ZXY-2.0 | | MP2W2 | | | 118P20502S2 |
| C21 | .1 600V | (.05mfd) * | P688N-1 | DF-104 | CUB6P1 | 6DP-3-104 | GEM-601 | 6TM-P1 |

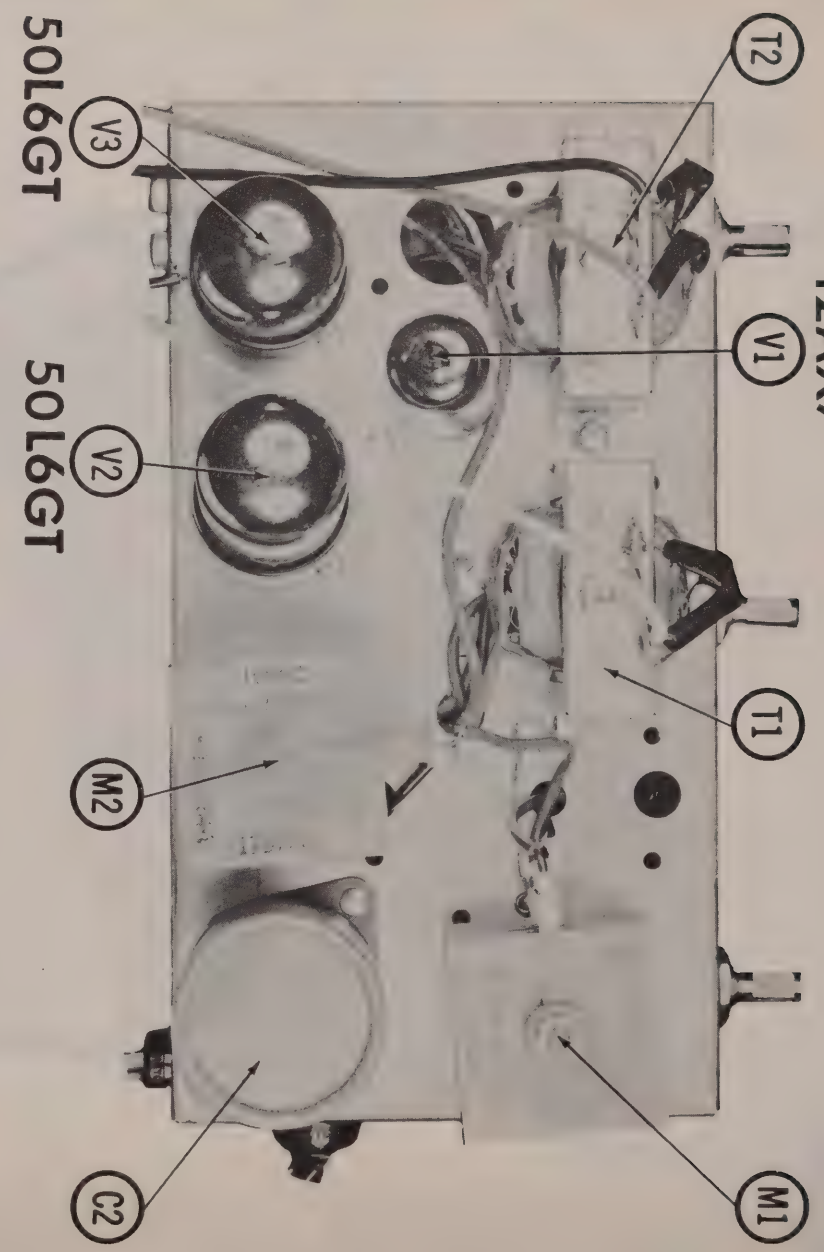
* Alternate Value.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA TRAV-LER PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 3meg* | ½ | VC-152 | | | | ◆ UE3956 | Volume, Channel 1 |
| B | 3meg* | ½ | | | | | | Volume, Channel 2 |
| R2A | 250K † | ½ | VC-151 | | | | ■ UE4007 | Treble, Channel 1 |
| B | 250K † | ½ | | | | | | Treble, Channel 2 |
| R3A | 2meg | ½ | VC-153 | B-75 | AD47-2meg-S | Q11-139 | ▲ UE1878 | Bass, Channel 1 |
| B | 2meg | ½ | | SR-75 | Not Req. | M11-139 | | Bass, Channel 2 |
| C | Shaft | | | Not Req. | KSS-3 | Not Req. | | |

* Tap @ 1meg and 2meg.
† Tap @ 150K.
◆ "STA-LOC" equivalent: FA36T95, RU36T95, CS3500.
■ "STA-LOC" equivalent: FA254T1253, RU254T1253, CS3500.
▲ "STA-LOC" equivalent: FA26L, RU26L, CS3500.

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 47K | |
| R5 | 220K | |
| R6 | 100K | |
| R7 | 2. 2meg | |
| R8 | 470K | |
| R9 | 270Ω | |
| R10 | 470K | |
| R11 | 220Ω 1W | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R12 | 47K | |
| R13 | 47K | |
| R14 | 220K | |
| R15 | 100K | |
| R16 | 2. 2meg | |
| R17 | 470K | |
| R18 | 270Ω | |
| R19 | 470K | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R20 | 220Ω 1W | |
| R21 | 47K | |
| R22 | 10K 1W | |
| R23 | 125Ω 5W | |
| R24 | 27Ω 10W | |
| R25 | 22Ω 1W | |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE PRI. | IMPEDANCE SEC. 1 | REPLACEMENT DATA TRAV-LER PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 4500Ω | 80Ω | AT-47 | | | | | | | |
| | | SEC. 2 | | | | | | | | |
| | | 1-2Ω | | | | | | | | |
| | | SEC. 1 | | | | | | | | |
| T2 | 4500Ω | 80Ω | AT-47 | | | | | | | |
| | | SEC. 2 | | | | | | | | |
| | | 1-2Ω | | | | | | | | |

## SPEAKER

| ITEM No. | TYPE SIZE | TYPE FIELD | TYPE V. C. IMP. | REPLACEMENT DATA TRAV-LER PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | 6" | PM | 3-4Ω | SPK-62① | 6A31 | ① Model 1005 only. |
| | 8" | PM | | SPK-60③ | | ② Model 1005, & 1105 |
| SP2 | 5" | PM | 3-4Ω | SPK-36② | 5A07 | ③ Model 1105 only. |
| SP3 | 3" | PM | 4-5Ω | SPK-28② | 3A15TZ4. 7 | |

## RECTIFIERS

| ITEM No. | RATING CURRENT (Measured) | REPLACEMENT DATA TRAV-LER PART No. | INTERNATIONAL PART No. | ITT PART No. | SARKES TARZIAN PART No. | SYLVANIA PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | . 210A | SR-5① | T300① | 1236AH① | 300① | SR500② | ① Selenium Type |
| M2 | . 210A | SR-5① | T300① | 1236AH① | 300① | SR500② | ② Silicon Type |

## PHONO CARTRIDGE

| ITEM No. | TRAV-LER PART No. | ASTATIC PART No. CARTRIDGE | ASTATIC PART No. NEEDLE | ELECTRO-VOICE PART No. CARTRIDGE | ELECTRO-VOICE PART No. NEEDLE | JENSEN PART No. CARTRIDGE | JENSEN PART No. NEEDLE | SONOTONE PART No. CARTRIDGE | SONOTONE PART No. NEEDLE |
|---|---|---|---|---|---|---|---|---|---|
| M3 | PU-36 | 76-TB | Not Req. | *66 | Not Req. | | | 8TA4-S | N-8TA-S |

* Use Mount PT-3.

## PHONO NEEDLE

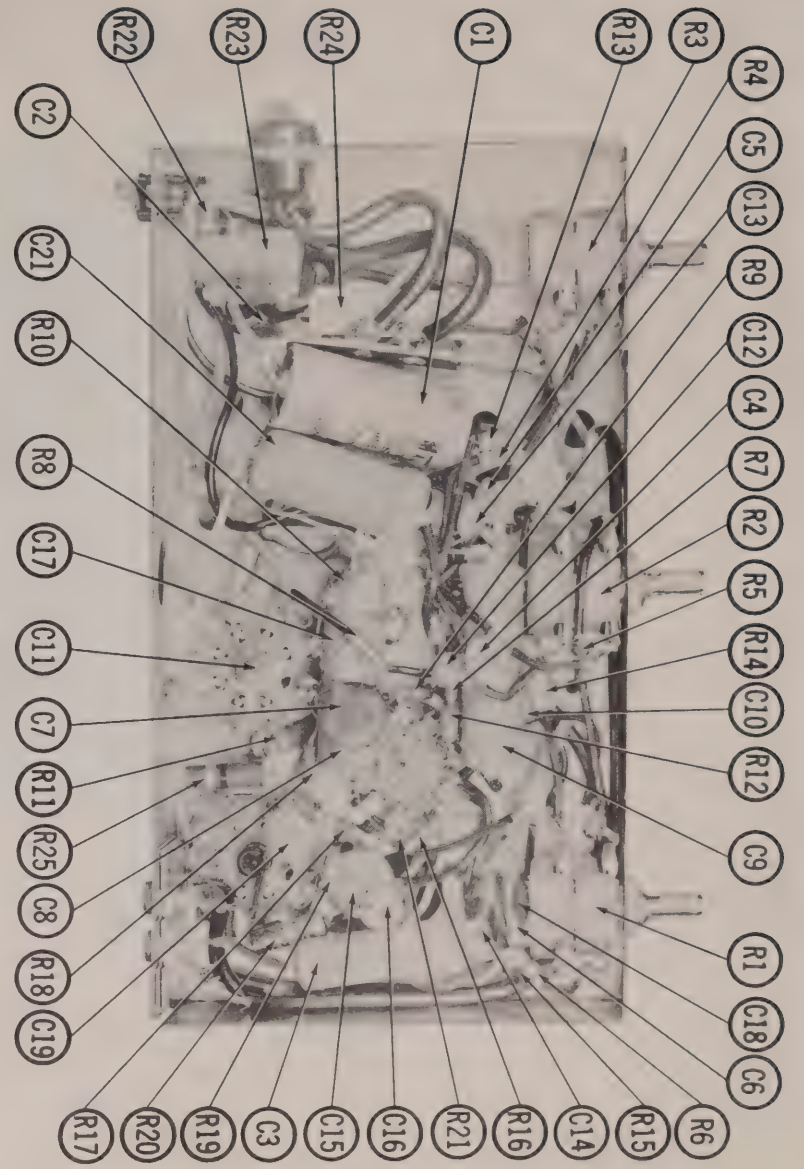
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

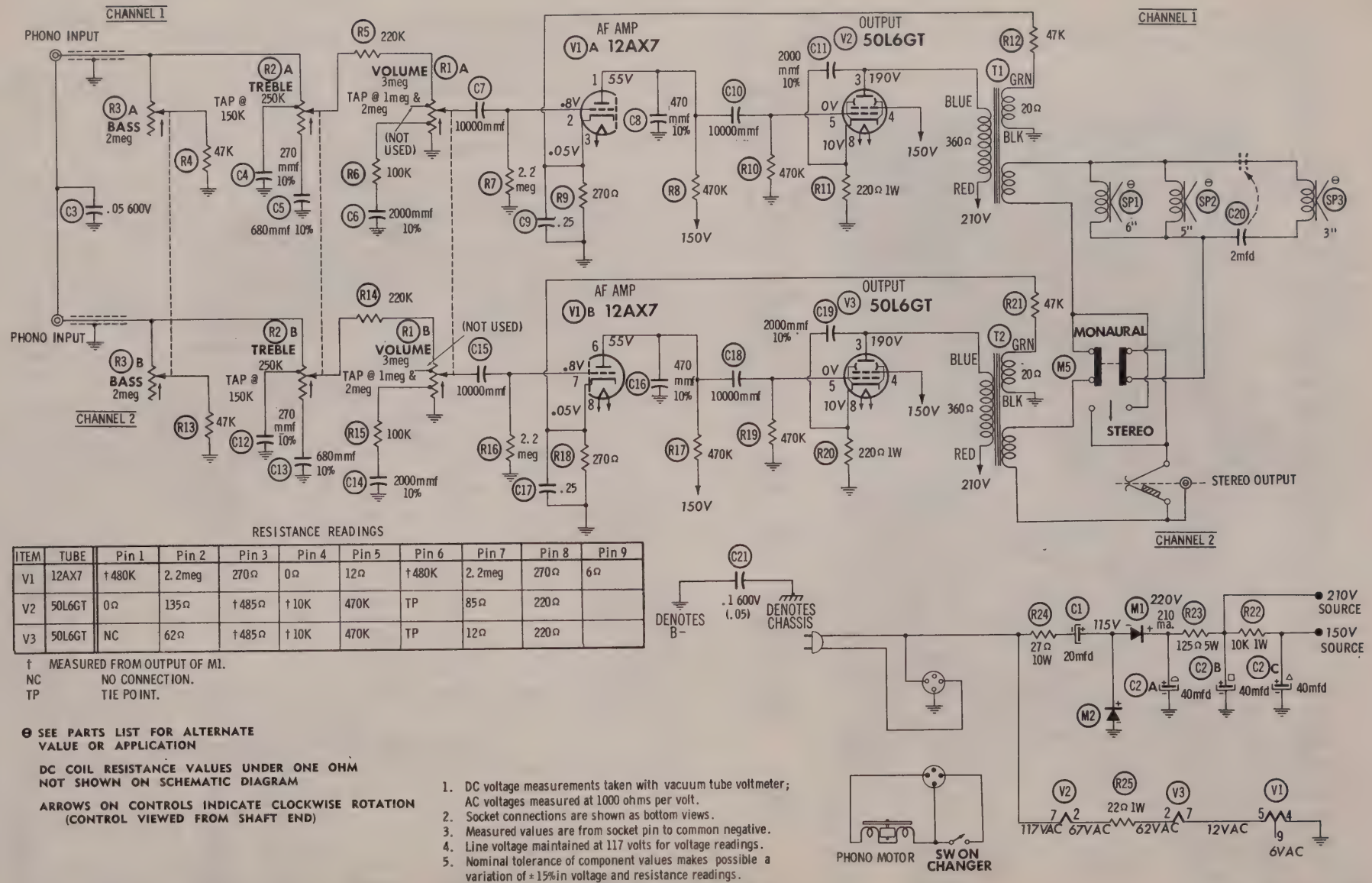
| ITEM No. | REPLACEMENT DATA TRAV-LER PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | REMARKS |
|---|---|---|---|---|
| M4 | (78RPM) | | CRA-55 † | † Jewel ♦ Diamond |
| | (LP) | | CRA-55X † or CRA-55XD ♦ | |

## MISCELLANEOUS

| ITEM No. | PART NAME | TRAV-LER PART No. | NOTES |
|---|---|---|---|
| M5 | Switch | SW-27 | Speaker (DPDT, Slide Type) |

# CHASSIS—BOTTOM VIEW






RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AX7 | †480K | 2.2meg | 270Ω | 0Ω | 12Ω | †480K | 2.2meg | 270Ω | 6Ω |
| V2 | 50L6GT | 0Ω | 135Ω | †485Ω | †10K | 470K | TP | 85Ω | 220Ω | |
| V3 | 50L6GT | NC | 62Ω | †485Ω | †10K | 470K | TP | 12Ω | 220Ω | |

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.
TP TIE POINT.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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**TRAV-LER MODELS 1005, 1105**

PHOTOFACT® Folder •with CIRCUITRACE®

# WEBCOR MODELS CP1956-1, EP1956-1 (Ch. 14X307)

WEBCOR MODELS CP1956-1, EP1956-1 (Ch. 14X307)

WEBCOR MODELS CP1956-1, EP1956-1 (Ch. 14X307)

| | |
|---|---|
| TRADE NAME | Webcor Models CP1956-1, EP1956-1 (Ch. 14X307) |
| MANUFACTURER | Webcor, Inc., 5610 W. Bloomingdale Ave., Chicago 39, Illinois |
| TYPE SET | AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer |
| POWER SUPPLY | 105-120 Volts AC, 60 Cycles RATING 28 Watts, .31 Amp. @117 Volts AC (Less Motor) |

RECORD CHANGER E168-25

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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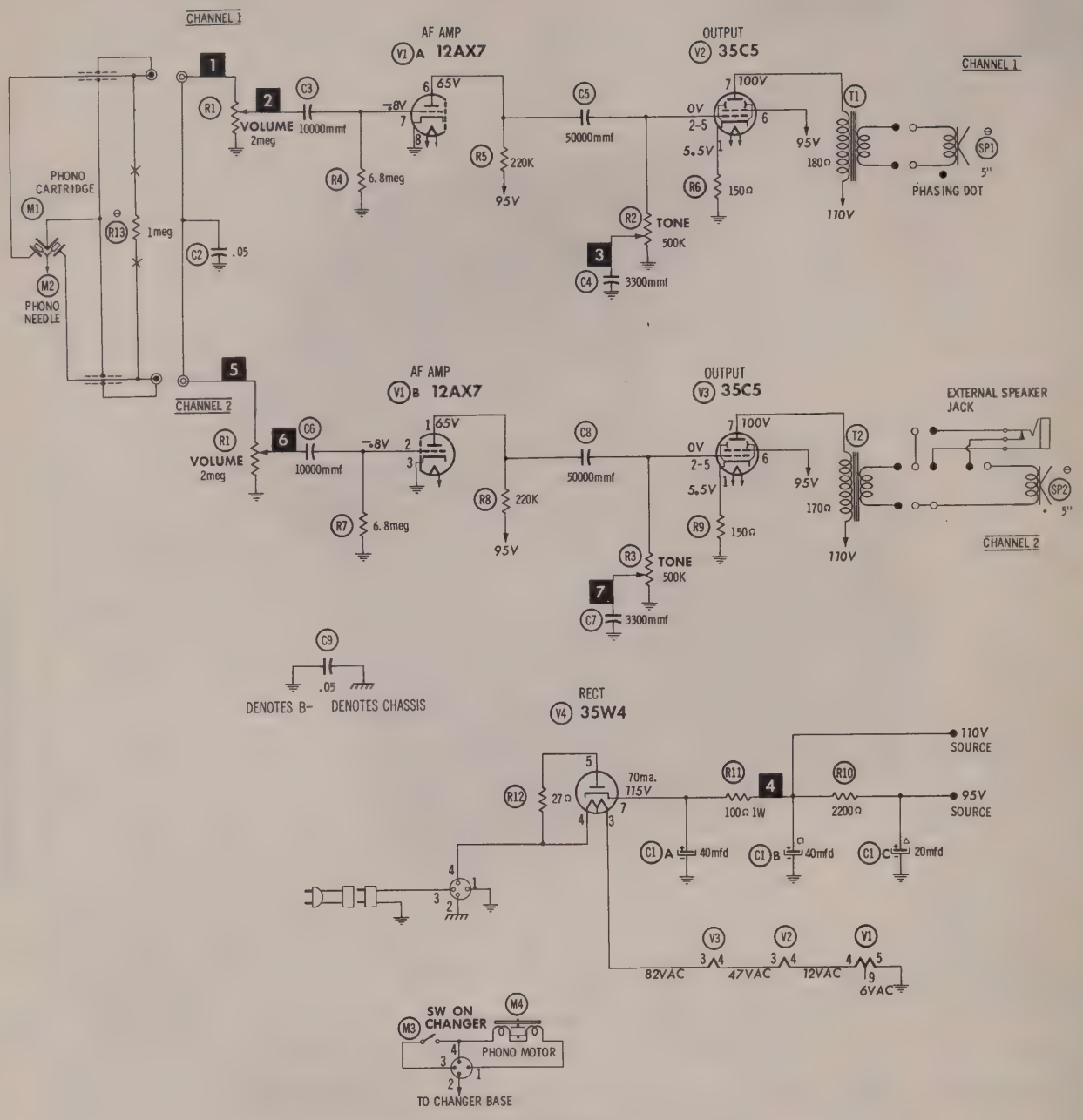


RESISTANCE READINGS

| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V1 | 12AX7 | †220K | 6.8meg | 0Ω | 12Ω | 0Ω | †220K | 6.8meg | 0Ω | 6Ω |
| V2 | 35C5 | 150Ω | 500K | 47Ω | 12Ω | 500K | †2300Ω | †280Ω | | |
| V3 | 35C5 | 150Ω | 500K | 82Ω | 47Ω | 500K | †2300Ω | †270Ω | | |
| V4 | 35W4 | NC | NC | 82Ω | 117Ω | 145Ω | TP | ¶ | | |

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION.
TP TIE POINT.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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**WEBCOR MODELS CP1956-1, EP1956-1 (Ch. 14X307)**

# PARTS LIST AND DESCRIPTIONS

## TUBES

| • CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA • | | | | | |
|---|---|---|---|---|---|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| V1 | Channel 1 AF Amp. - Channel 2 AF Amp. | 12AX7 | V3 | Channel 2 Output | 35C5 |
| V2 | Channel 1 Output | 35C5 | V4 | Rectifier | 35W4 |

## ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT. | WEBCOR PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | MALLORY PART No. | PYRAMID PART No. | SPRAGUE PART No. | |
| C1A | 40 | 150 | 30P258 | PWH3-11-30 | C0090 ‡ | PFP311.63 | TDLT-4 | PCL-3439 | |
| B | ■40 | 150 | | | | | | | |
| C | ▲20 | 150 | | | | | | | |

‡ Use printed circuit adaptor #55277 and 55278.

## FIXED CAPACITORS

**Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C2 | .05 400V | | P415IN-047 | DD-503 | BC6S47J | 4DP-3-503 | ACE615 | 4SE-S47 |
| C3 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C4 | 3300 | | BPD-0033 | DD-332 | BYA10D33 | CCD-332 | GP233 | 5HK-D33 |
| C5 | 50000 | | BPD-05 | DD-503 | CUB6S5 | 4DP-3-503 | GP150 | 5HK-S50 |
| C6 | 10000 | | BPD-01 | DD-103 | BYA10S1 | CCD-103 | GP110 | 5HK-S10 |
| C7 | 3300 | | BPD-0033 | DD-332 | BYA10D33 | CCD-332 | GP233 | 5HK-D33 |
| C8 | 50000 | | BPD-05 | DD-503 | CUB6S5 | 4DP-3-503 | GP150 | 5HK-S50 |
| C9 | .05 400V | | P415IN-047 | DD-503 | BC6S47J | 4DP-3-503 | ACD615 | 4SE-S47 |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | WEBCOR PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. | |
| R1A | 2meg | 1/2 | 31P152 | | | | | Volume, Channel 2 |
| B | 2meg | 1/2 | | | | | | Volume, Channel 1 |
| R2 | 500K | 1/2 | 31P153 | | | | | Tone, Channel 1 |
| R3 | 500K | 1/2 | 31P153 | | | | | Tone, Channel 2 |

## RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R4 | 6.8meg | |
| R5 | 220K | |
| R6 | 150Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R7 | 6.8meg | |
| R8 | 220K | |
| R9 | 150Ω | |

| ITEM No. | RATING | REMARKS |
|---|---|---|
| R10 | 2200Ω | |
| R11 | 100Ω 1W | |
| R12 | 27Ω | |
| R13 | 1meg | Note 1 |

Note 1. Not used in early versions.

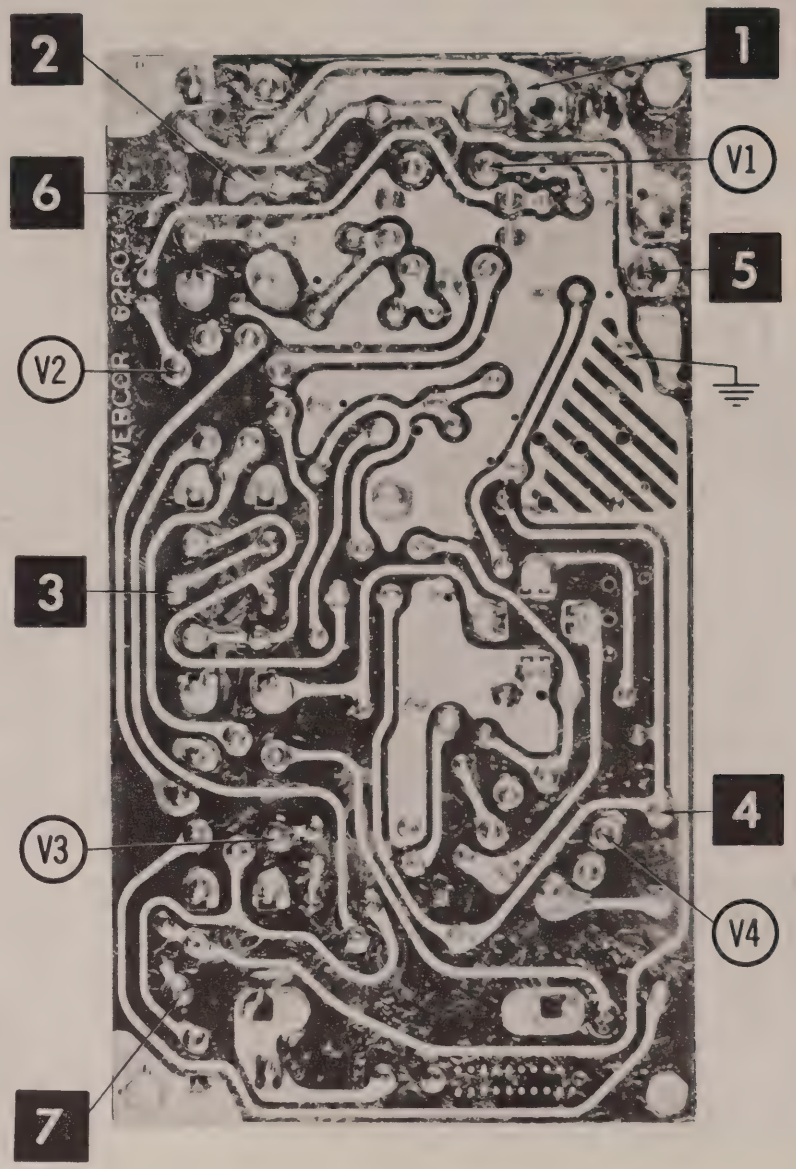
## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. | WEBCOR PART No. | Halldorson PART No. | Merit PART No. | Ram PART No. | Stancor PART No. | Thordarson PART No. | Triad PART No. | |
| T1 | 2400Ω | 3-4Ω | 67P064 | 22S46① | A-2928① | AU-603① | A-3876① | 22S46① | S-1X① | ① Use Original Frame |
| T2 | 2600Ω | 3-4Ω | 67P074 | 22S46 | A-2928 | AU-603 | A-3876 | 22S46 | S-1X | |

# PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



# PARTS LIST AND DESCRIPTIONS (Continued)

## SPEAKER

| ITEM No. | TYPE | | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | WEBCOR PART No. | QUAM PART No. | |
| SP1 | 5" | PM | 3-4Ω | ① 76P075-2 | 5AQ5 | ① Alternate Part #76P075 |
| SP2 | 5" | PM | 3-4Ω | ① 76P075-2 | 5AQ5 | |
| | 5" | PM | 1.6Ω | ② | | ② External Speaker System in Model 4906. Connect in Series. |
| | 5" | PM | 1.6Ω | ② | | |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | WEBCOR PART No. | ASTATIC PART No. | | ELECTRO-VOICE PART No. | | JENSEN PART No. | | SONOTONE PART No. | |
| | | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE | CARTRIDGE | NEEDLE |
| M1 | 21P586① | 13T | Not. Req. | 13 | Not Req. | | | 8TA4-S | N-8TA-S |

① Includes needles.

## PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

| ITEM No. | REPLACEMENT DATA | | | REMARKS |
|---|---|---|---|---|
| | WEBCOR PART No. | CLEVITE WALCO PART No. | JENSEN PART No. | |
| M2 | 21P586 * | * W-204DS †♦ or * W-204DD-1 ♦ | * A-44X † or * A-44XSD †♦ or * A-44XDD ♦ | † Jewel ♦ Diamond * Includes Cartridge. |

## MISCELLANEOUS

| ITEM No. | PART NAME | WEBCOR PART No. | NOTES |
|---|---|---|---|
| M3 | Switch | | Off-On (Part of Changer) |
| M4 | Motor | | Turntable Drive (Part of Changer) |

## CABINETS & CABINET PARTS

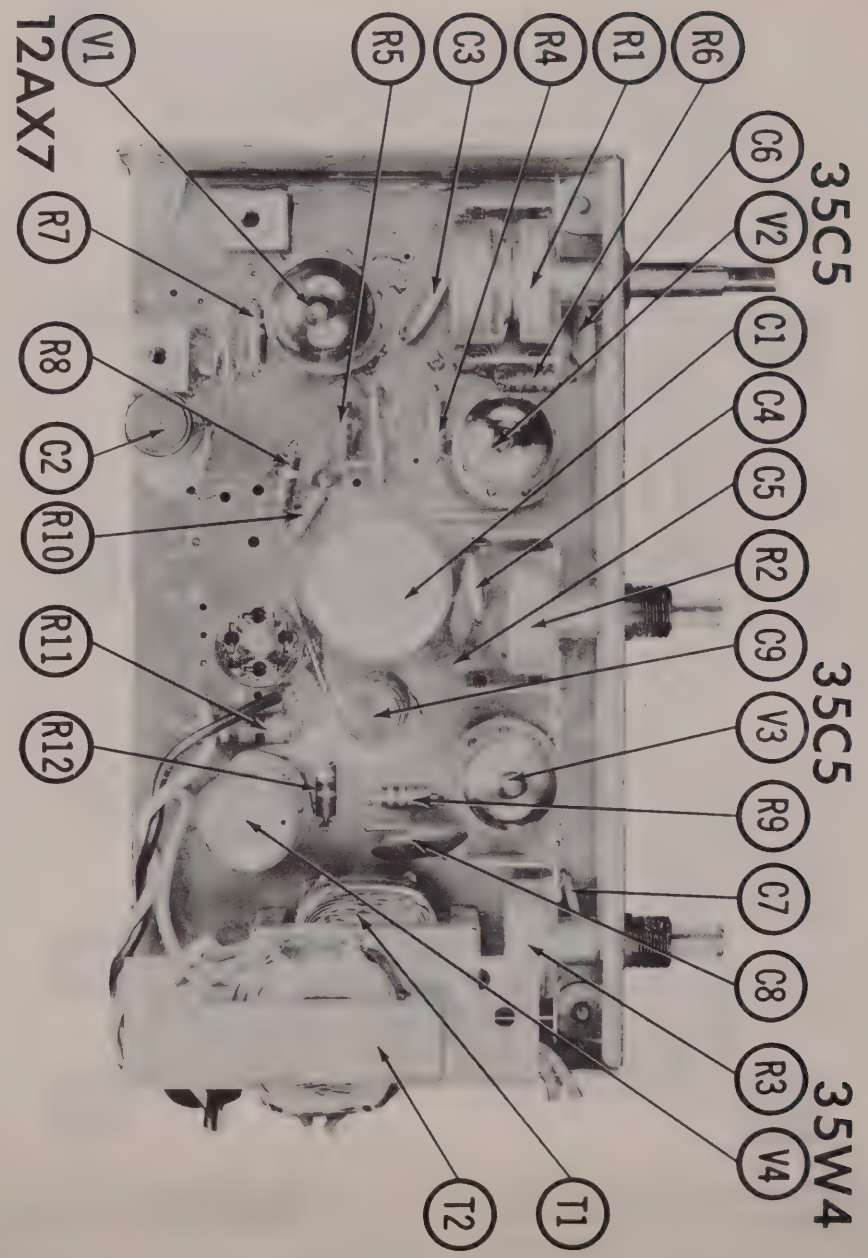
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

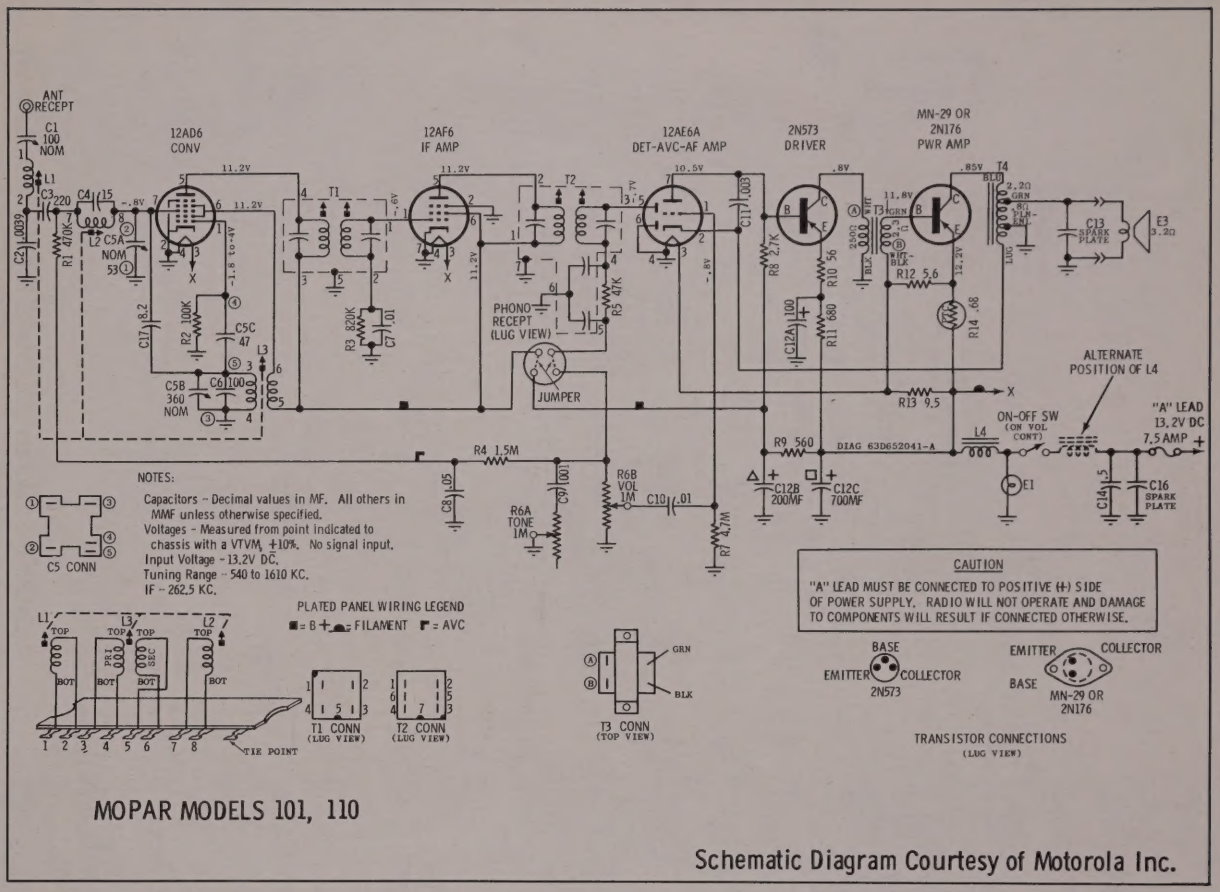
| NAME | PART NO. | DESCRIPTION |
|---|---|---|
| Knob | 39P141-T | Volume, (Outer) Channel 1 |
| Knob | 39P206-8 | Volume, (Inner) Channel 2 |
| Knob | 39P205-13 | Tone, Channel 1 |
| Knob | 39P205-14 | Tone, Channel 2 |
| Case | 92X010-1 | Coral |
| Case | 92X010-2 | Black |
| Handle | 39P049 | |

## WIRING DATA

| | |
|---|---|
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in Ten Colors<br>8524 (Stranded) Available in Ten Colors |
| Power Cord | Use BELDEN No. 1765-B (6 Ft. Length)<br>1725-K (7½ Ft. Length) |
| Low-Loss Shielded Lead (Interconnecting) | Use BELDEN No. 8401 |
| Phono Pick-up Arm Cable | Use BELDEN No. 8430 (Two Conductor - Twisted) |

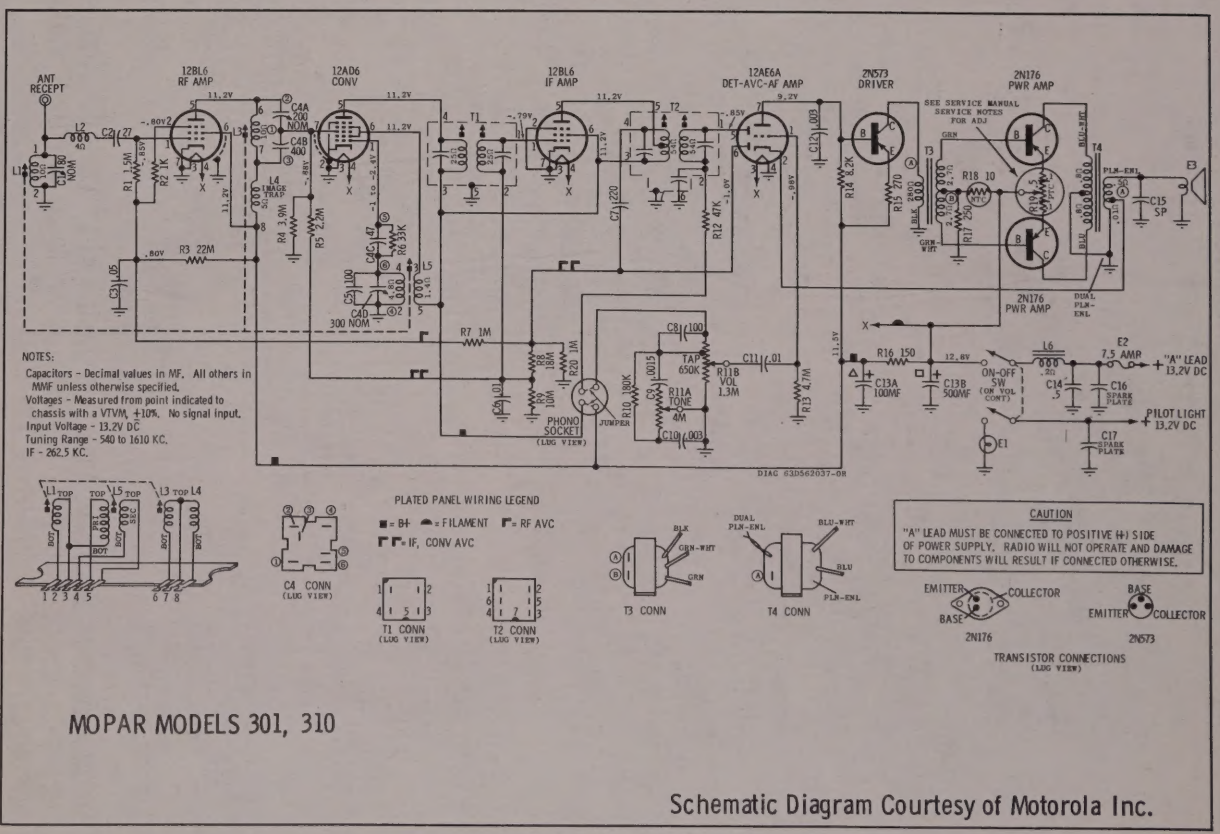
## CHASSIS—TOP VIEW




ANT RECEPT
12AD6 CONV
12AF6 IF AMP
12AE6A DET-AVC-AF AMP
2N573 DRIVER
MN-29 OR 2N176 PWR AMP
PHONO RECEPT (LUG VIEW)
JUMPER
ALTERNATE POSITION OF L4
ON-OFF SW (ON VOL CONT)
"A" LEAD 13.2V DC 7.5 AMP
DIAG 63D652041-A
NOTES:
Capacitors - Decimal values in MF. All others in MMF unless otherwise specified.
Voltages - Measured from point indicated to chassis with a VTVM, ±10%. No signal input.
Input Voltage - 13.2V DC.
Tuning Range - 540 to 1610 KC.
IF - 262.5 KC.
C5 CONN
PLATED PANEL WIRING LEGEND
■ = B+ ▬ = FILAMENT ■ = AVC
TIE POINT
T1 CONN (LUG VIEW)
T2 CONN (LUG VIEW)
T3 CONN (TOP VIEW)
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.
TRANSISTOR CONNECTIONS (LUG VIEW)

## MOPAR MODELS 101, 110

Schematic Diagram Courtesy of Motorola Inc.

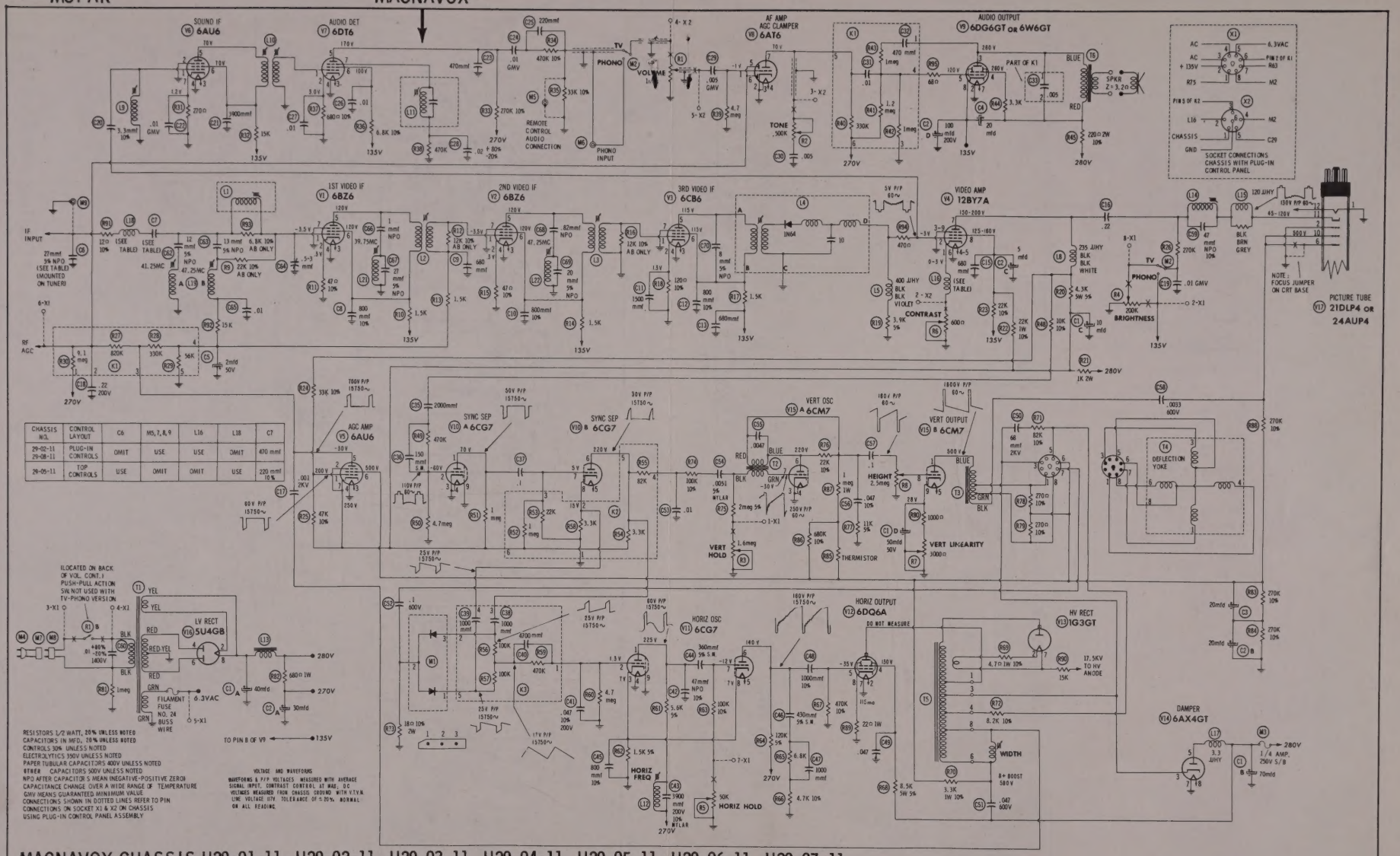

ANT RECEPT
12BL6 RF AMP
12AD6 CONV
12BL6 IF AMP
12AE6A DET-AVC-AF AMP
2N573 DRIVER
2N176 PWR AMP
SEE SERVICE MANUAL SERVICE NOTES FOR ADJ
PHONO SOCKET (LUG VIEW)
JUMPER
ON-OFF SW (ON VOL CONT)
"A" LEAD 13.2V DC
PILOT LIGHT 13.2V DC
DIAG 63D562037-08
NOTES:
Capacitors - Decimal values in MF. All others in MMF unless otherwise specified.
Voltages - Measured from point indicated to chassis with a VTVM, ±10%. No signal input.
Input Voltage - 13.2V DC
Tuning Range - 540 to 1610 KC.
IF - 262.5 KC.
PLATED PANEL WIRING LEGEND
■ = B+ ▬ = FILAMENT ■ = RF AVC
■ ■ = IF, CONV AVC
C4 CONN (LUG VIEW)
T1 CONN (LUG VIEW)
T2 CONN (LUG VIEW)
T3 CONN
T4 CONN
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.
TRANSISTOR CONNECTIONS (LUG VIEW)

## MOPAR MODELS 301, 310

Schematic Diagram Courtesy of Motorola Inc.

← MOPAR

MAGNAVOX




| CHASSIS NO. | CONTROL LAYOUT | C6 | MS,7,8,9 | L16 | L18 | C7 |
|---|---|---|---|---|---|---|
| 29-02-11 29-08-11 | PLUG-IN CONTROLS | OMIT | USE | USE | OMIT | 470 mmf |
| 29-05-11 | TOP CONTROLS | USE | OMIT | OMIT | USE | 220 mmf 10% |

RESISTORS 1/2 WATT, 20% UNLESS NOTED
CAPACITORS IN MFD., 20% UNLESS NOTED
CONTROLS 30% UNLESS NOTED
ELECTROLYTICS 350V UNLESS NOTED
PAPER TUBULAR CAPACITORS 400V UNLESS NOTED
OTHER CAPACITORS 500V UNLESS NOTED
NPO AFTER CAPACITOR IS MEAN INEGATIVE-POSITIVE ZERO)
CAPACITANCE CHANGE OVER A WIDE RANGE OF TEMPERATURE
GMV MEANS GUARANTEED MINIMUM VALUE
CONNECTIONS SHOWN IN DOTTED LINES REFER TO PIN CONNECTIONS ON SOCKET X1 & X2 ON CHASSIS USING PLUG-IN CONTROL PANEL ASSEMBLY

VOLTAGE AND WAVEFORMS
WAVEFORMS & P/P VOLTAGES MEASURED WITH AVERAGE SIGNAL INPUT, CONTRAST CONTROL AT MAX. DC VOLTAGES MEASURED FROM CHASSIS GROUND WITH 117V AC LINE VOLTAGE (117V ±10% TOLERANCE OF ±10%). NORMAL OR ALL READING

MAGNAVOX CHASSIS U29-01-11, U29-02-11, U29-03-11, U29-04-11, U29-05-11, U29-06-11, U29-07-11, U29-08-11, U29-09-11, U29-13-11, V29-01-11, V29-02-11, V29-03-11, V29-04-11, V29-05-11, V29-06-11, V29-07-11, V29-08-11, V29-09-11, V29-13-11

Schematic Diagram Courtesy of The Magnavox Company

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